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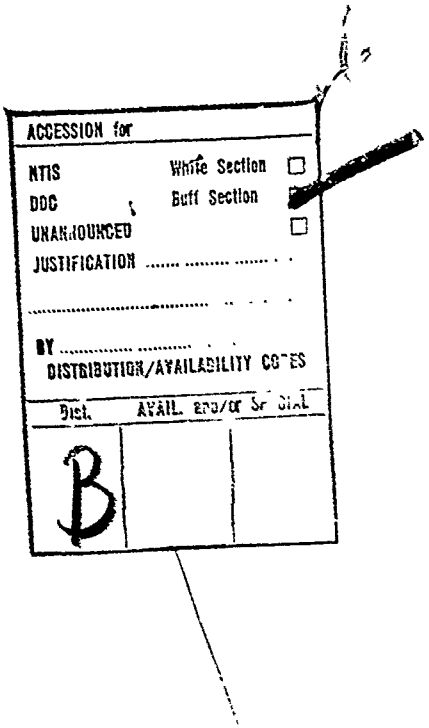
UNITED STATES AIR FORCE
HILL AIR FORCE BASE, UTAH
84406

PROPELLANT SURVEILLANC REPORT LGM-30F & G STAGE I PHASE A, SERIES II TP-H1011

PROPELLANT LABORATORY SECTION

MAGCP REPORT
NR 271(73)

JULY 1973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MAGCP REPORT NR-271(73)

PROPELLANT SURVEILLANCE REPORT

LGM-30 F & G STAGE I

PHASE A, SERIES VI, TP-H1011

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ABSTRACT

This report contains propellant test results from cartons of TP-H1011 bulk propellant representing LGM-30 F and G First Stage Minuteman Motors. This report uses a statistical approach to analyze the bulk carton propellant. Testing was accomplished in accordance with MMEMP Project M-41785M, DO 12 Nr 2MP-155P, 72NE068.

An analysis of all parameters indicates that seven years of aging at 77°F temperature has not greatly affected the properties of the propellant. No potential problems are expected in the propellant for at least two years past the oldest data point.

Each point on the regression plot represents all samples at that particular age. The number of samples at each point is indicated on the sample size summary sheet on the page accompanying each regression plot. The data range at any age can be found by suitable inquiry of the G085 System.

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GLOSSARY OF TERMS AND ABBREVIATIONS

Aging Trend	A change in properties or performance resulting from aging of material or component
CSA	Cross Sectional Area
E	Modulus (psi), defined as stress divided by strain along the initial linear portion of the curve
EB	End Bonded
EGL	Effective Gage Length
em	Strain at maximum stress
er	Strain at rupture
DB	Dogbone
Degradation	Gradual deterioration of properties or performance
"F" ratio	The ratio of the variance accounted for by the regression function to the random unexplained variance. The regression function having the most significant "F" ratio is used for plotting data. The ratio is also used in detecting significant changes in random variation between succeeding time points.
JANNAF	Joint Army, Navy, NASA, Air Force Committee
MAGCP	Propellant Lab Section at OOAMA
OOAMA	Ogden Air Materiel Area, Air Force Logistics Command
Regression Equation	The general form of the regression equation is $Y = a + bx$
Regression Line	Line representing mean test values with respect to time
S_b	Standard error of estimate of the regression coefficient
S_e or $S_{Y.X}$	Standard deviation of the data about the regression line

GLOSSARY OF TERMS AND ABBREVIATIONS (cont)

SM	Maximum Stress
Sr	Stress at rupture
Standard Deviation (S_Y)	Square root of variance
Strain Rate	Crosshead speed divided by the EGL
"t" test	A statistical test used to detect significant differences between a measured parameter and an expected value of the parameter (determines if regression slope differs from zero at the 95% confidence level)
Variance	The sum of squares of deviations of the test results from the mean of the series after division by one less than the total number of test results
3 Sigma Band	The area between the upper and lower 3 sigma limit. It can be expected that 99.73% of the inventory represented by the test samples would fall within this range assuming that the population is normally distributed.
90-90 Band	It can be stated with 90% confidence that 90% of the inventory represented by the test samples would fall within this range assuming that the population is normally distributed.

LIST OF REFERENCES

Report Nr	Title	Report Date
	LGM-30 First Stage, Wing I Test Reports	
29A	Test Report (Missile in silo)	13 Jan 64
29B	Zero Time Test Results	29 Jan 64
29C	Zero Time Test Results (Supplement 1)	30 Mar 64
29D	Zero Time Test Results (Aft Closure)	9 Jun 64
29E	Zero Time (Aft Closure Supplement 1)	24 Jun 64
29F	ATP Phase I Test Results	30 Mar 65
29G	ATP Phase I Test Results	19 Aug 65
29H	ATP Phase I Test Results	10 Sep 65
32A	Zero Time, Wings II-V Test Results	17 Mar 65
32B	Zero Time, Wings II-V Test Results (Aft Closure)	18 Mar 65
32C	ATP Phase I, Wings II-V Test Results	3 Nov 65
49	ATP Phase I, Wings II-V (First Group)	18 Mar 66
53	ATP Phase I, Wings II-V (Second Group)	22 Apr 66
55	ATP Phase I, Wings II-V (Third Group)	29 Apr 66
58	ATP Phase I, Wings II-V (Fourth Group)	6 May 66
61	ATP Phase I, Wings II-V (Fifth Group)	10 Jun 66
66	ATP Phase I, Wings II-V (Sixth Group)	22 Jul 66
76	ATP Phase II, Wing I Test Results	24 Jan 67
78	Zero Time, Wing VI Test Results	3 Feb 67
104	ATP Phase I, Wing VI (First Group)	12 Oct 67
118	ATP Phase II, Wings II-V (First Group)	5 Mar 68
126	ATP Phase II, Wings II-V (Second Group)	11 Apr 68
130	ATP Phase II, Wings II-V (Third Group)	3 May 68

LIST OF REFERENCES (cont)

Report Nr	Title	Report Date
162	ATP Phase I, Wing VI (Second Group)	30 Sep 69
176	ATP Phase II, Wing VI (First Group)	15 Apr 70
181	ATP Phase III, Wing I	7 May 70
185	ATP Phase I, Wing VI (Third Group)	22 Jun 70
195	ATP Phase III, Wings II-V (Retest)	29 Oct 70
223	Surveillance Report LGM-30 Stage I (TP-H1011)	Sep 71
239	Surveillance Report LGM-30 Stage I (TP-H1011 and TP-H1043)	Apr 72
258	Surveillance Report LGM-30A & B Stage I, (TP-H1011)	Nov 72
268	Surveillance Report LGM-30A & B Stage I, (TP-H1011)	May 73

INTRODUCTION

A. PURPOSE:

Quality assurance tests have been conducted for eleven years on First Stage LGM-30A, B, F and G Minuteman Motor propellant blocks to evaluate the effects of aging on TP-H1011 propellant. This report contains only those tests conducted on propellant from LGM-30F and G as instructed in Test Directive GTD-1C, Amendment 1, LGM-30 First Stage Operational Propellant Laboratory Testing.

Statistical analysis of the tests performed should provide early warning if serious degradation trends occur. Annual evaluation of the propellant provides data for input into engineering reliability for service life predictions. Testing was performed in accordance with MMEMP Directive GTD-1C, Amendment 1.

B. BACKGROUND:

LGM-30F and G testing was started in 1966 with phase testing at 24 month intervals (Report Numbers 78 - zero time; 104, 162, 185-Phase I, 176, 239, 257-Phase II). Report Number 257 was the first time that LGM-30F and G data were reported in statistical analysis by itself. The present report is a continuation of testing and statistical analysis by the G085 system.

Zero time testing for LGM-30A, B, F and G was started as soon as possible after receipt of the propellant by MAGCP. Data from these tests were used to establish a base line for each test parameter.

The LGM-30F and G propellant test matrix (Table 1) is used to determine the number of specimens to be taken from eacn propellant loaf and the specific test or tests to which these specimens are to be subjected. Very low rate and low rate tensile specimens are taken on all LGM-30F and G blocks. Specimens for other physical and combustion tests are taken from every third (LGM-30F and G) block.

TABLE 1

SAMPLE PLAN

The Procedure for determining tests to be performed on propellant batch samples of LGM-30 F & G First Stage Motors are as follows:

1. Divide the USAF motor serial numbers into three groups by dividing the last three digits of each serial number by three to determine the remainder integer, e.g., 154 ÷ 3 = 51 with a remainder integer of 1.

2. Use the remainder integer to enter the following matrix to determine the group of tests to be performed on the forward, middle, and aft batch samples associated with a particular motor serial number.

GROUP MATRIX

TP-H1011 PROPELLANT BATCH SAMPLE	GROUP I	GROUP II	GROUP III
Forward	1	2	0
Middle	0	1	2
Aft	2	0	1

Each group will receive the following tests:

TEST MATRIX

GROUP I	GROUP II	GROUP III
High Rate Triaxial	Dynamic Response	High Rate Hydrostatic
Creep	Stress Relaxation	Sol Gel
Biaxial Low Rate	Burning Rate	DSC
TCLE	Heat of Explosion	TGA
Hardness	Pressure Time	DTA
Ignitability		Impact

NOTE: Low Rate and Very Low Rate Tensile tests are performed on all blocks.

STATISTICAL APPROACH

Linear regression analysis was used as the method of data evaluation. Data from different time periods were used to establish a least squares trend line for the data. The variance about the regression line, obtained using individual values of the dependent variable, was used to compute a tolerance interval such that at the 90% confidence level, 90% of the sample distribution falls within this interval. This tolerance interval was extrapolated to a maximum of 24 months. The "t" values and the significance of this statistic, which are reported for each regression model, give an indication of the "statistical significance" of the slope of the trend line as compared to a line of zero slope. Data were plotted by the computer. The "y" axis is computed so that the values at one inch intervals are peculiar to the data spread of the parameter tested.

TEST RESULTS

VERY LOW RATE TENSILE:

The strain properties are decreasing with the stresses and modulus increasing. All of the regressions show a statistically significant increase or decrease, but should not affect the propellant serviceability at this time (Figures 1 thru 5).

LOW RATE BIAXIAL TENSILE:

Strain at maximum stress, maximum stress, and strain at rupture show a statistically significant increase. However, it should be noted the slope of the curves is relatively flat. Stress at rupture and modulus show no significant trend (Figures 6 thru 10).

LOW RATE TENSILE:

For all parameters except strain at rupture a statistically significant increase is shown (Figures 11 thru 15).

HIGH RATE TRIAXIAL:

Strain at maximum stress and strain at rupture show no significant trends. Maximum stress, stress at rupture, and modulus show a statistically significant trend (Figures 16 thru 20).

HYDROSTATIC TENSILE:

No significant trend is shown except for modulus. The modulus trend is decreasing, but the slope is gradual and should not present a problem at this time (Figures 21 thru 25).

TENSILE TESTING SUMMARY:

Stresses and modulus are gradually increasing with age as expected. Very low rate tensile strain shows a gradual decrease. Low rate tensile strain at rupture shows no significant change; all other strain graphs show a gradual increase. No operational problems are indicated in the propellant at this time.

CREEP COMPLIANCE:

The regressions show a decreasing trend except for strain at rupture which shows an increase. This agrees well with the tensile results (Figures 26 thru 30).

STRESS RELAXATION:

Data were obtained at temperatures of -65, -40, 20, 77, 100, 120, 140, 160 and 180°F (Figures 31 thru 66). At -65, -40 and 20°F the trends show a decrease except for stress relaxation modulus at -40 degrees F at 10 sec (Figure 35) and 20 degrees F at 1000 sec (Figure 42). For all other temperatures no significant changes are shown except for stress relaxation modulus at 120 degrees F, 10 and 50 sec (Figures 51 and 52) and 140 degrees F 1000 sec (Figure 58).

CONSTANT STRAIN:

The regression analysis indicates a statistically significant downward trend of the rupture strain although the slope is gradual (Figure 67).

DYNAMIC RESPONSE:

The storage shear modulus at 200 and 500 Hz shows a decrease in the slope of the regression line. This slope is closer to zero or flat than in the previous report (Figures 68 thru 71).

The loss tangent at 200 and 500 Hz shows a gradual increase in the slope of the regression line (Figures 68 thru 71).

FAILURE ENVELOPE:

The majority of the points are resonably close to the curve (Figure 72).

DTA:

The endotherm shows a statistically significant increase. However, the slope of the regression line is relatively flat.

The first exotherm shows a statistically significant decrease and the second and third exotherms show no significant change.

The ignition temperature shows a statistically significant increase.

Where a significant change is shown the slope of the regression line is gradual (Figures 73 thru 77).

HEAT OF EXPLOSION:

Although the regression slope is statistically significant, the slope of the regression line is close to zero and therefore, no operational problems are expected at this time (Figure 78).

PRESSURE TIME:

The data are widely scattered on both the time to maximum pressure and the maximum pressure regressions. No aging trends are evident (Figures 79 and 80).

BURNING RATE:

Although this test shows a statistically significant increase, it should be noted that if the zero time testing points were eliminated (possible post-cure) the slope of the regression line would be practically flat (Figure 81).

IGNITABILITY:

The ignition threshold shows no significant trend (Figure 82).

IMPACT SENSITIVITY:

The regression shows no significant change (Figure 83).

SHORE HARDNESS:

Very little change is occurring in the hardness (Figure 68).

SOL GEL:

The weight swell ratio, cross link density and density data show a statistically significant trend. However, the slopes are very flat and the propellant service life may be extended for at least two years from the date of last testing. The percent extractables by weight shows no significant trend (Figures 85 thru 88).

CONCLUSIONS

Seven years of aging at ambient temperature (77°F) has not greatly affected the properties of the propellant. Some test parameters indicate slight aging trends, but nothing that would adversely affect the operational characteristics of the rocket motor propellant.

From the statistical analysis, it does not appear that significant propellant degradation is occurring and the propellant reliability should not be affected for at least two years past the last data point. Since failure limits are not available for the parameters tested, this statement is based on the fact that the slopes of the regression curves are relatively close to zero or flat.

RECOMMENDATIONS

It is recommended that testing be continued on a regular basis to evaluate the effects of aging on motor propellant, and to assure that the propellant will perform as designed.

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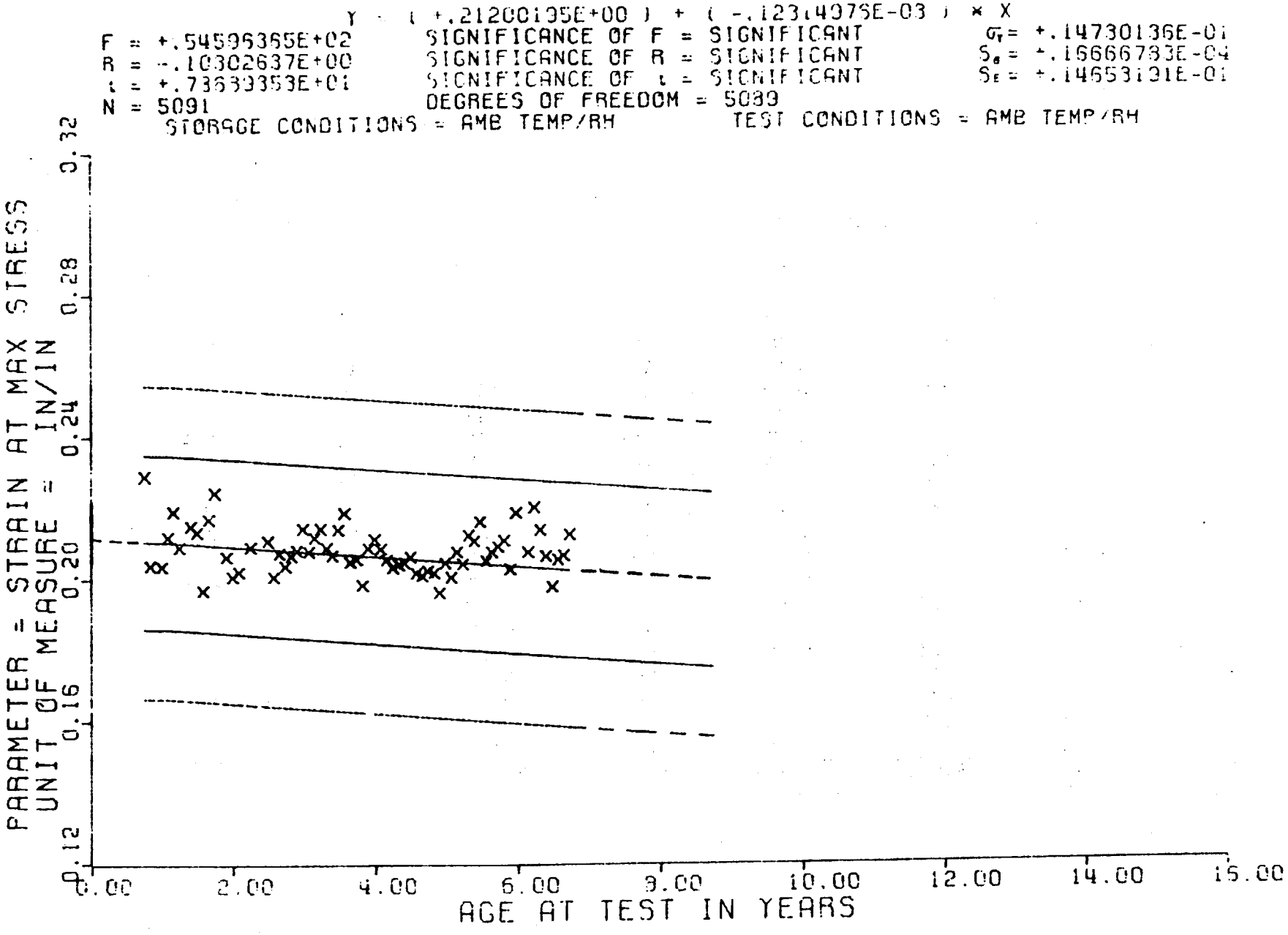
SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
9.0	10	33.0	82	51.0	136	69.0	64
10.0	5	34.0	87	52.0	158	70.0	59
12.0	15	35.0	72	53.0	175	71.0	21
13.0	15	36.0	87	54.0	155	72.0	30
14.0	10	37.0	93	55.0	320	74.0	25
15.0	20	38.0	86	56.0	313	75.0	15
17.0	20	39.0	69	57.0	216	76.0	30
18.0	25	40.0	71	58.0	200	77.0	15
19.0	22	41.0	79	59.0	196	78.0	5
20.0	13	42.0	90	60.0	321	79.0	10
21.0	10	43.0	109	61.0	167	80.0	10
23.0	15	44.0	70	62.0	175	81.0	10
24.0	11	45.0	105	63.0	135		5,091
25.0	19	46.0	71	64.0	43		
27.0	15	47.0	127	65.0	16		
30.0	10	48.0	114	66.0	28		
31.0	41	49.0	118	67.0	21		
32.0	64	50.0	105	68.0	47		

Stage 1 Wing 6, TP-H 1011 Tensile, CHS 0.0020, EGL 3.00, CSA 0.1875 EM
Very Low Rate Tensile



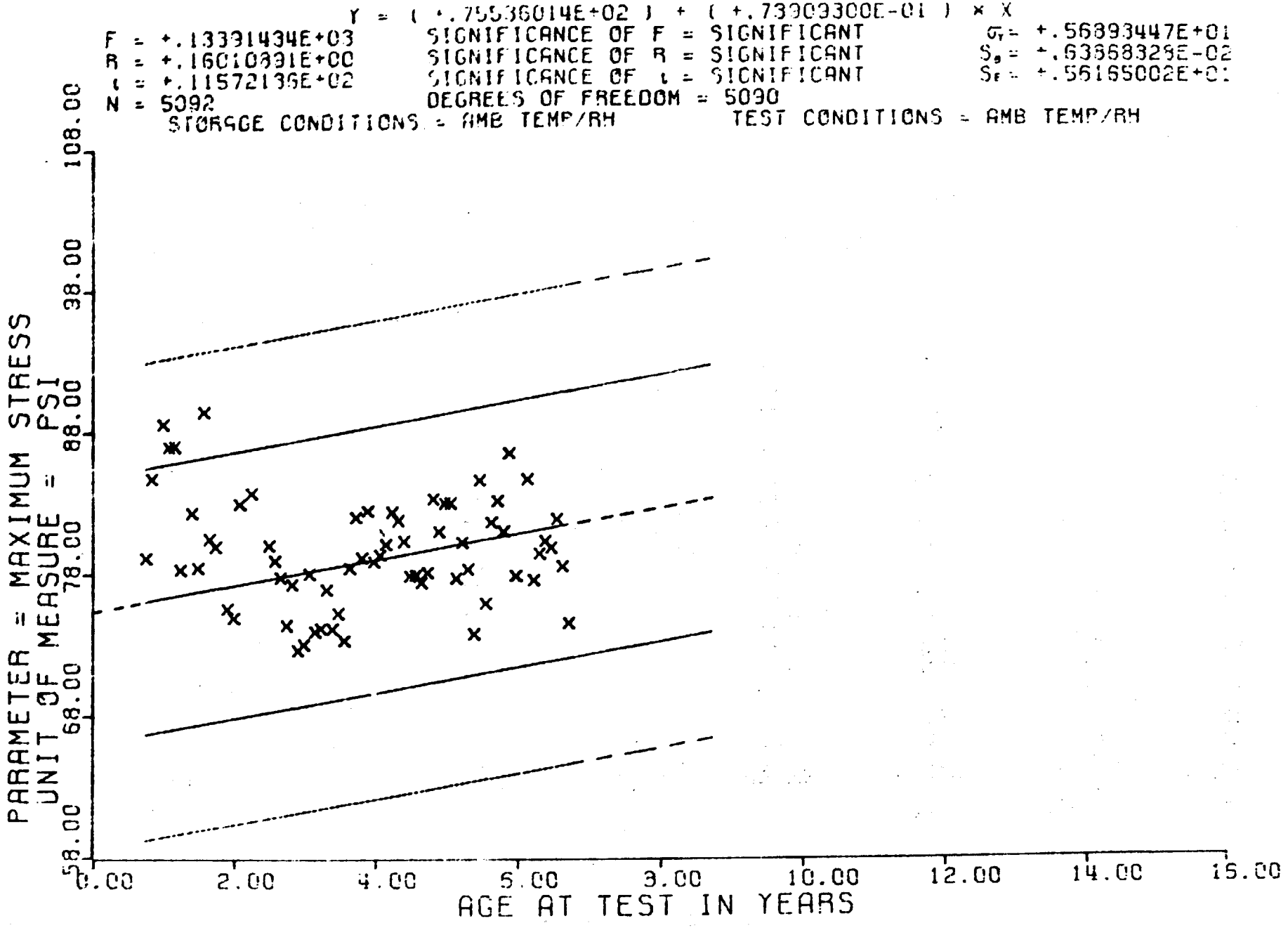
VERY LOW RATE TENSILE

Figure 1

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
9.0	10	34.0	87	53.0	175	72.0	30
10.0	5	35.0	72	54.0	155	74.0	25
12.0	15	36.0	87	55.0	320	75.0	15
13.0	15	37.0	93	56.0	313	76.0	30
14.0	10	38.0	86	57.0	216	77.0	15
15.0	20	39.0	69	58.0	200	78.0	5
17.0	20	40.0	71	59.0	196	79.0	10
18.0	25	41.0	79	60.0	321	80.0	10
19.0	22	42.0	90	61.0	167	81.0	10
20.0	13	43.0	109	62.0	175		5,092
21.0	10	44.0	70	63.0	135		
23.0	15	45.0	105	64.0	43		
24.0	11	46.0	71	65.0	16		
25.0	19	47.0	127	66.0	28		
27.0	15	48.0	114	67.0	21		
30.0	10	49.0	118	68.0	47		
31.0	41	50.0	105	69.0	64		
32.0	64	51.0	136	70.0	60		
33.0	82	52.0	158	71.0	21		

Stage 1, Wing 6, TP-H 1011 Tensile, CSH 0.0020, EGL 3.00, CSA 0.1875 SM
Very Low Rate Tensile



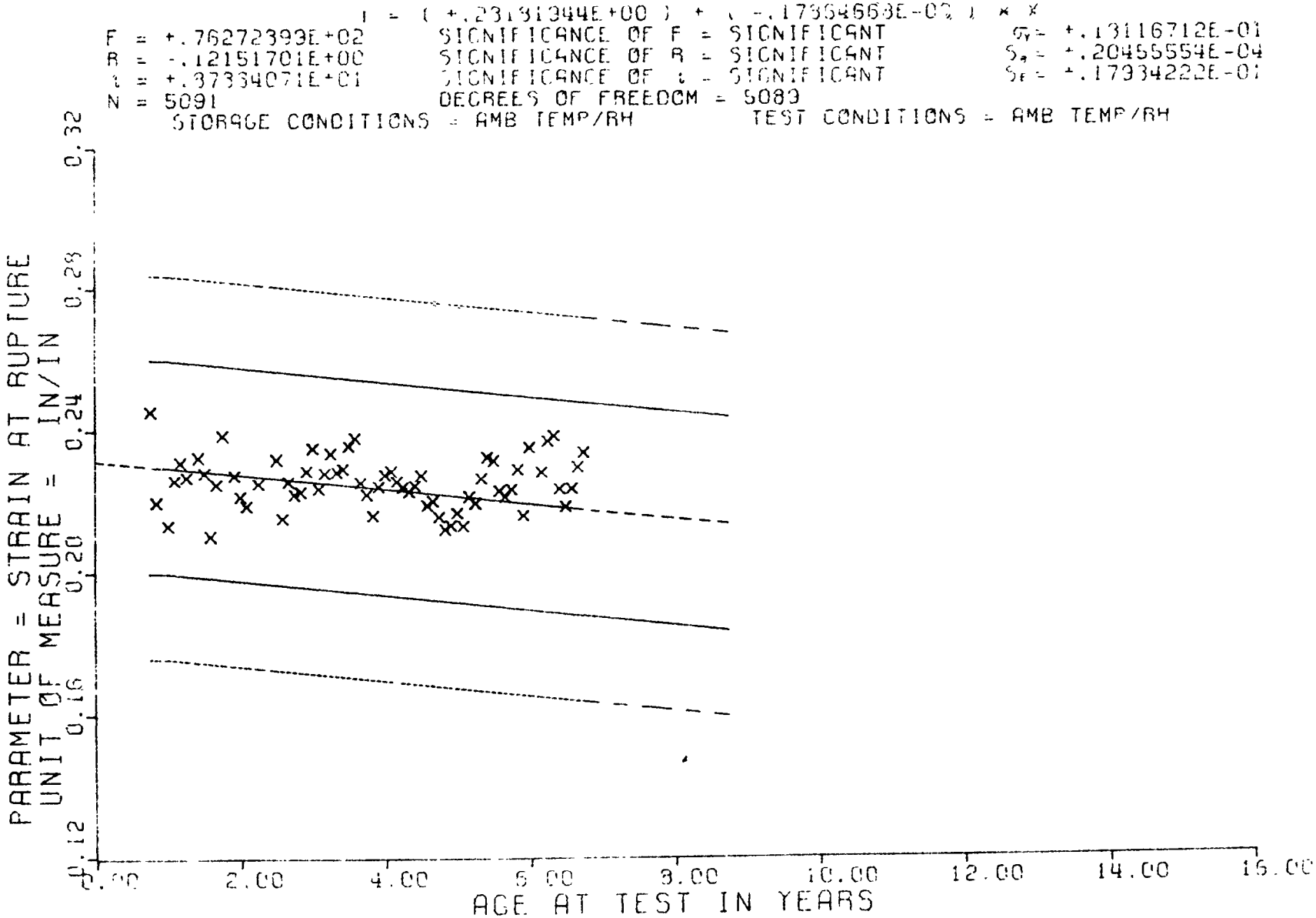
VERY LOW RATE TENSILE

Figure 2

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
9.0	10	33.0	82	51.0	136	69.0	64
10.0	5	34.0	87	52.0	158	70.0	59
12.0	15	35.0	72	53.0	175	71.0	21
13.0	15	36.0	87	54.0	155	72.0	30
14.0	10	37.0	93	55.0	320	74.0	25
15.0	20	38.0	86	56.0	313	74.0	15
17.0	20	39.0	69	57.0	216	76.0	30
18.0	25	40.0	71	58.0	200	77.0	15
19.0	22	41.0	79	59.0	196	78.0	5
20.0	13	42.0	90	60.0	321	79.0	10
21.0	10	43.0	109	61.0	167	80.0	10
23.0	15	44.0	70	62.0	175	81.0	10
24.0	11	45.0	105	63.0	135		5,091
25.0	19	46.0	71	64.0	43		
27.0	15	47.0	127	65.0	16		
30.0	10	48.0	114	66.0	28		
31.0	41	49.0	118	67.0	21		
32.0	64	50.0	105	68.0	47		

Stage 1 Wing 6, TP-H 1011 Tensile, CHS 0.0020, EGL 3.00, CSA 0.1875 ER
Very Low Rate Tensile



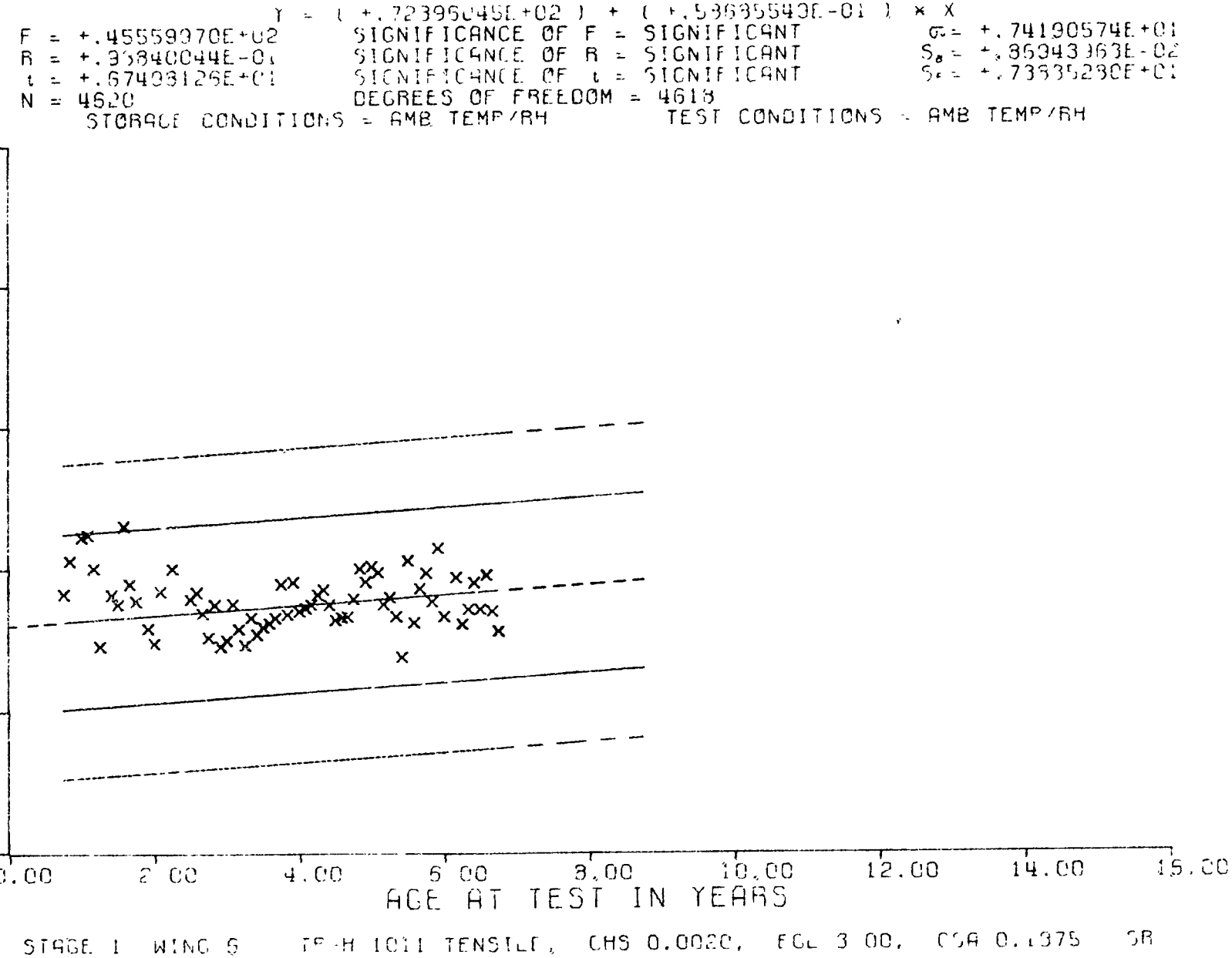
VERY LOW RATE TENSILE

Figure 3

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
9.0	10	33.0	70	51.0	136	69.0	64
10.0	5	34.0	72	52.0	158	70.0	60
12.0	15	35.0	69	53.0	175	71.0	21
13.0	15	36.0	77	54.0	155	72.0	30
14.0	10	37.0	84	55.0	320	74.0	25
15.0	20	38.0	71	56.0	313	75.0	15
17.0	20	39.0	60	57.0	206	76.0	30
18.0	25	40.0	65	58.0	124	77.0	15
19.0	22	41.0	72	59.0	129	78.0	5
20.0	13	42.0	82	60.0	233	79.0	10
21.0	10	43.0	87	61.0	123	80.0	10
23.0	15	44.0	67	62.0	145	81.0	10
24.0	11	45.0	105	63.0	112		4,620
25.0	19	46.0	71	64.0	39		
27.0	15	47.0	127	65.0	16		
30.0	10	48.0	114	66.0	28		
31.0	35	49.0	118	67.0	21		
32.0	59	50.0	105	68.0	47		

Stage 1 Wing 6, TP-H 1011 Tensile, CSH 0.0020, EGL 3.00, CSA 0.1875 SR
Very Low Rate Tensile

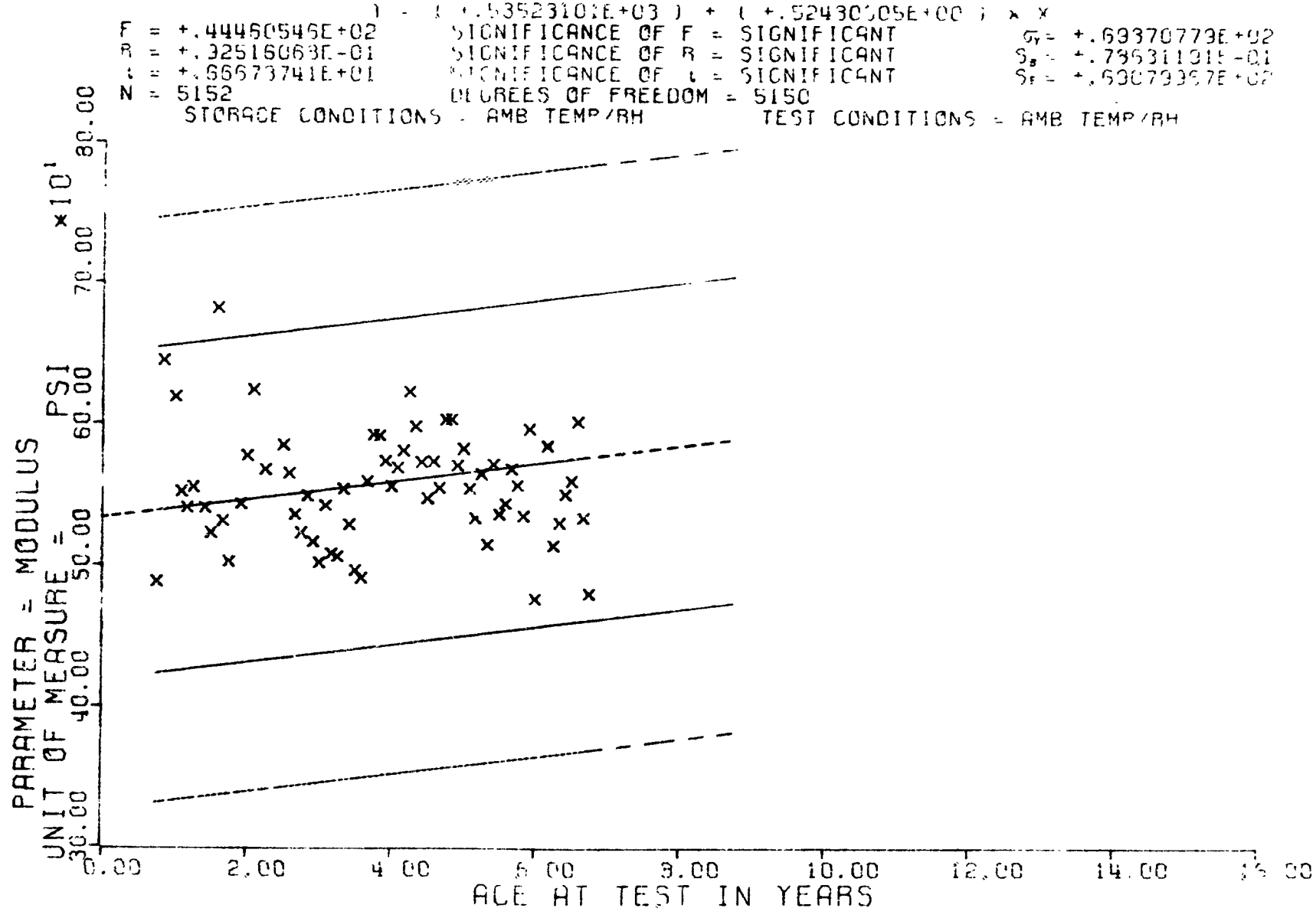


VERY LOW RATE TENSILE
Figure 4

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
9.0	10	33.0	82	51.0	136	69.0	64
10.0	5	34.0	87	52.0	158	70.0	59
12.0	15	35.0	72	53.0	175	71.0	24
13.0	15	36.0	87	54.0	155	72.0	27
14.0	10	37.0	93	55.0	320	74.0	25
15.0	17	38.0	86	56.0	315	75.0	15
17.0	20	39.0	69	57.0	214	76.0	30
18.0	25	40.0	71	58.0	200	77.0	15
19.0	22	41.0	79	59.0	223	78.0	3
20.0	13	42.0	90	60.0	345	79.0	10
21.0	10	43.0	109	61.0	170	80.0	10
23.0	15	44.0	70	62.0	180	81.0	10
24.0	11	45.0	105	63.0	151		5,152
25.0	19	46.0	71	64.0	43		
27.0	15	47.0	127	65.0	13		
30.0	10	48.0	114	66.0	28		
31.0	41	49.0	118	67.0	20		
32.0	64	50.0	105	68.0	42		

Stage 1 Wing 6, TP-H 1011 Tensile, CSH 0.0020, EGL 3.00, CSA 0.1875 MD
Very Low Rate Tensile

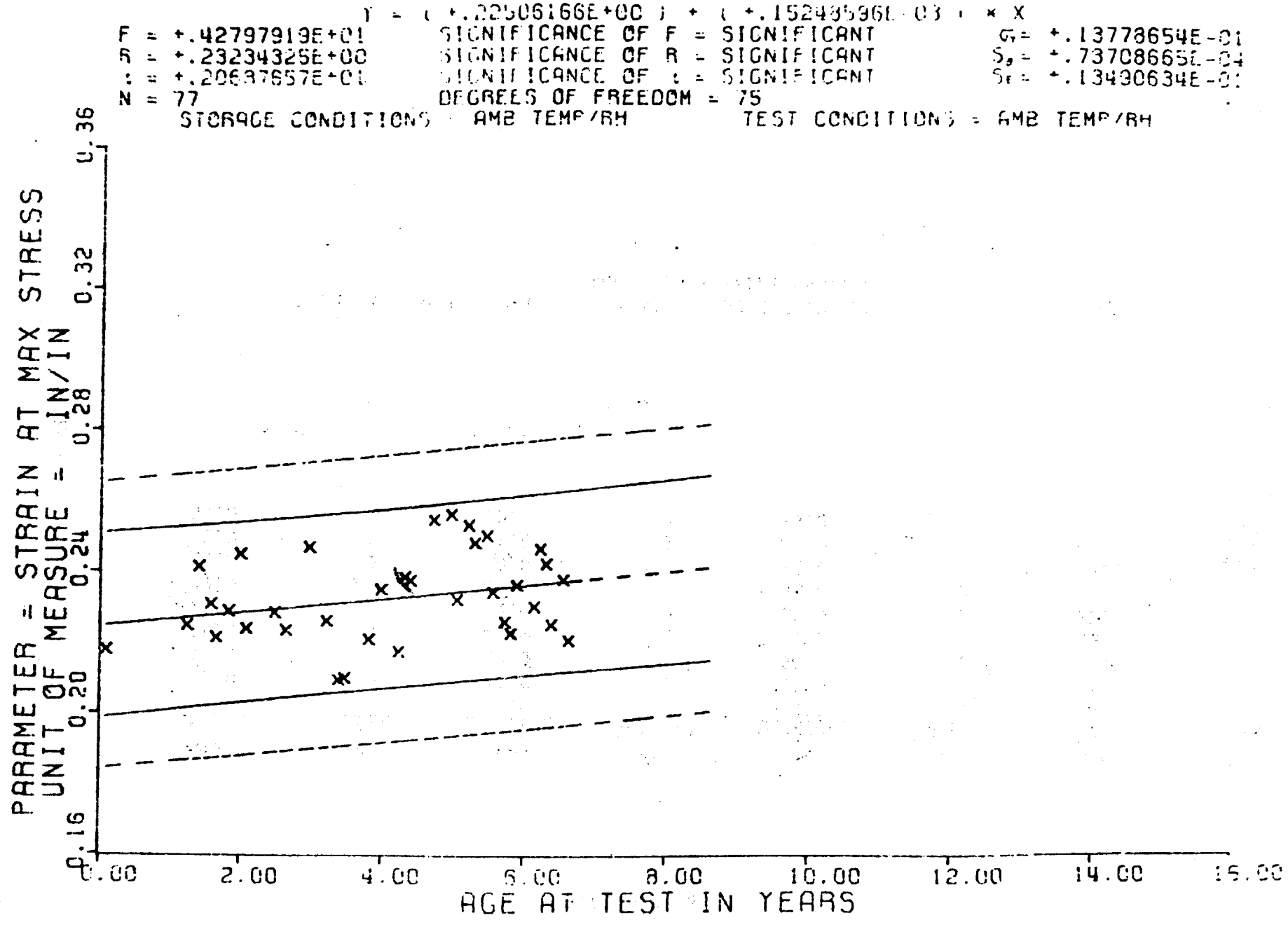


VERY LOW RATE TENSILE
Figure 5

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
1.0	1	32.0	2	53.0	2	70.0	2
15.0	2	36.0	2	57.0	2	73.0	2
17.0	2	39.0	4	60.0	2	74.0	2
19.0	2	41.0	2	61.0	2	75.0	4
20.0	2	42.0	2	63.0	2	76.0	2
22.0	2	46.0	2	64.0	2	77.0	2
24.0	2	48.0	2	66.0	2	79.0	2
25.0	2	51.0	2	67.0	4	80.0	2
30.0	2	52.0	2	69.0	4		77

Stage 1 Wing 6, TP-H 1011 Tensile, CHS 0000.2, EGL 1.75, CSA 1.8750 EM
Low Rate Biaxial Tensile



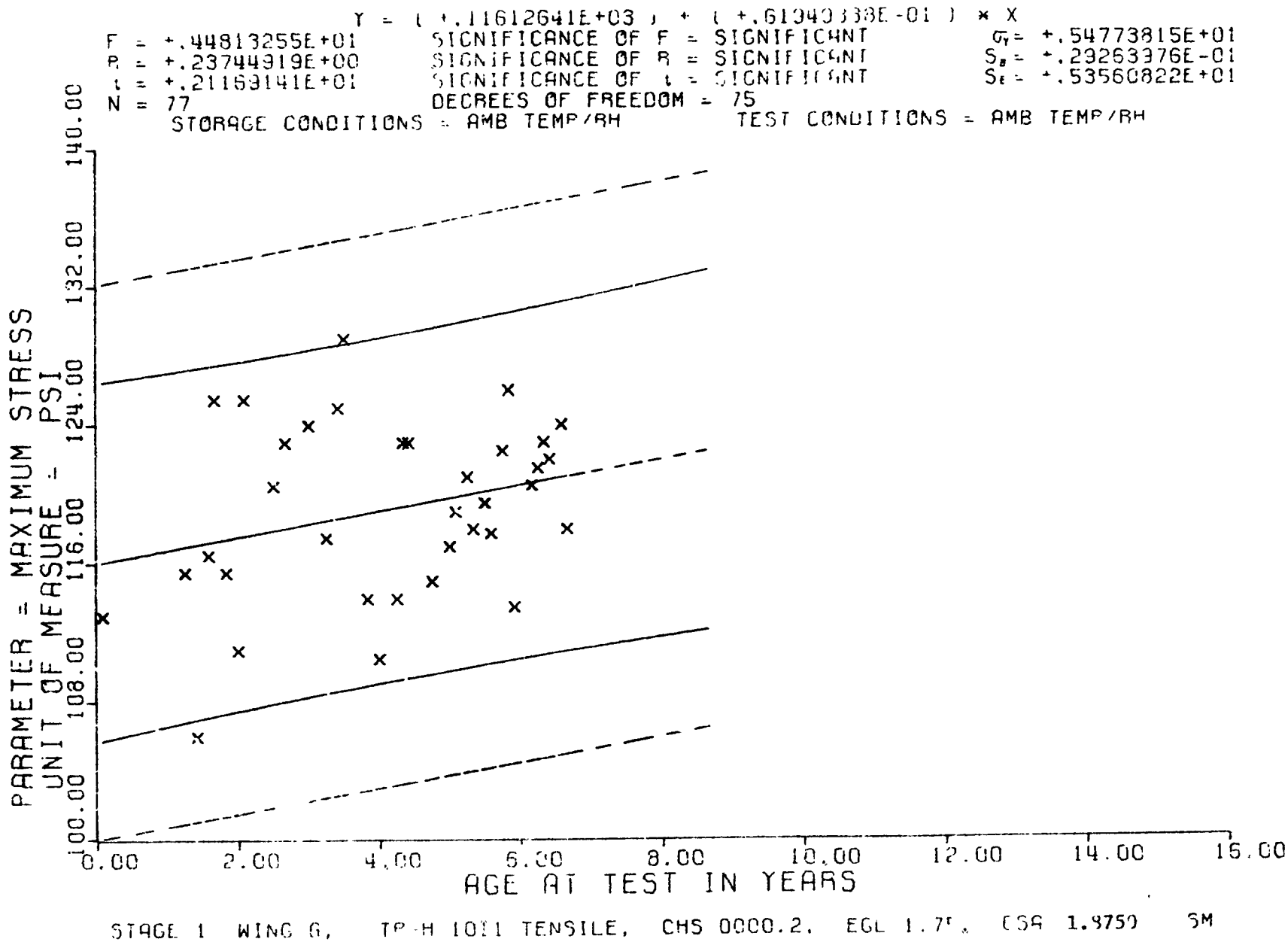
LOW RATE BIAXIAL TENSILE

Figure 6

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
1.0	1	32.0	2	53.0	2	70.0	2
15.0	2	36.0	2	57.0	2	71.0	2
17.0	2	39.0	4	60.0	2	74.0	2
19.0	2	41.0	2	61.0	2	75.0	4
20.0	2	42.0	2	63.0	2	76.0	2
22.0	2	46.0	2	64.0	2	77.0	2
24.0	2	48.0	2	66.0	2	79.0	2
25.0	2	51.0	2	67.0	4	80.0	2
30.0	2	52.0	2	69.0	4		77

Stage 1 Wing 6, TP-H 1011 Tensile, CSH 0000.2, EGL 1.75, CSA 1.8750 SM
Low Rate Biaxial Tensile

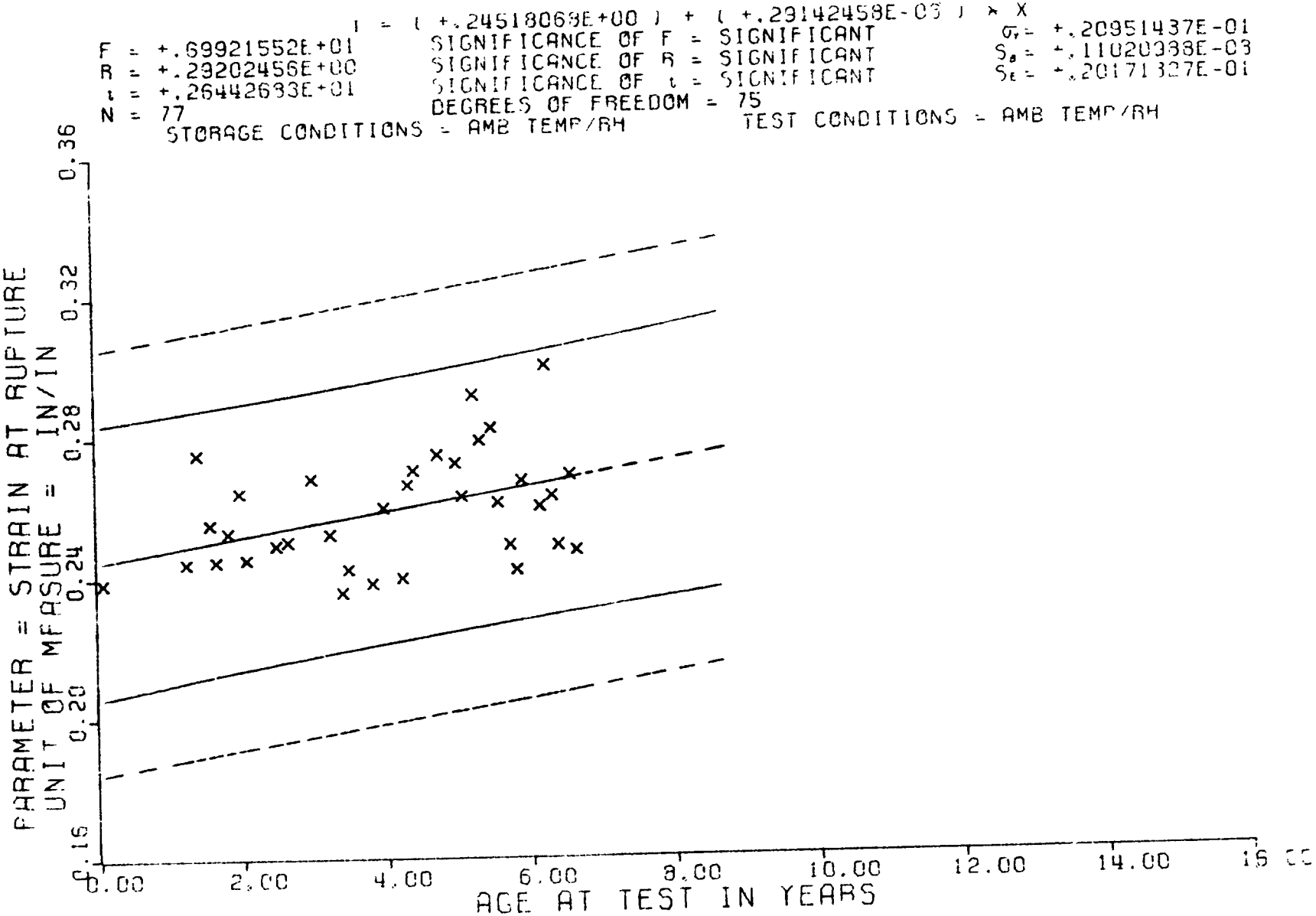


LOW RATE BIAXIAL TENSILE
Figure 7

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
1.0	1	32.0	2	53.0	2	70.0	2
15.0	2	36.0	2	57.0	2	71.0	2
17.0	2	39.0	4	60.0	2	74.0	2
19.0	2	41.0	2	61.0	2	75.0	4
20.0	2	42.0	2	63.0	2	76.0	2
22.0	2	46.0	2	64.0	2	77.0	2
24.0	2	48.0	2	66.0	2	79.0	2
25.0	2	51.0	2	67.0	4	80.0	2
30.0	2	52.0	2	69.0	4		77

Stage 1 Wing 6, TP-H 1011 Tensile, CHS 0000.2, EGL 1.75, CSA 1.8750 ER
Low Rate Biaxial Tensile



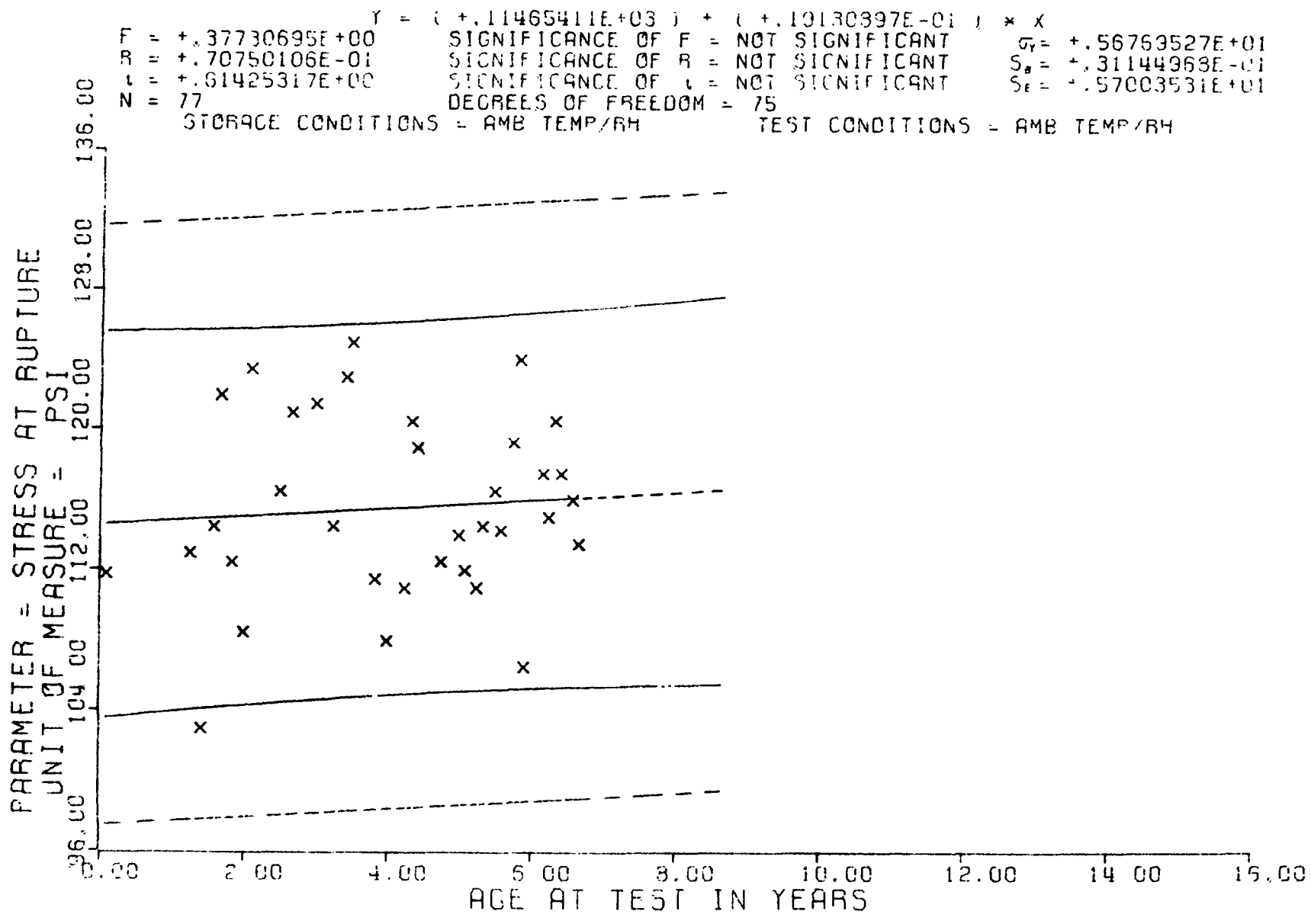
LOW RATE BIAXIAL TENSILE

Figure 8

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
1.0	1	32.0	2	53.0	2	70.0	2
15.0	2	36.0	2	57.0	2	71.0	2
17.0	2	39.0	4	60.0	2	74.0	2
19.0	2	41.0	2	61.0	2	75.0	4
20.0	2	42.0	2	63.0	2	76.0	2
22.0	2	46.0	2	64.0	2	77.0	2
24.0	2	48.0	2	66.0	2	79.0	2
25.0	2	51.0	2	67.0	4	80.0	2
30.0	2	52.0	2	69.0	4		77

Stage 1 Wing 6, TP-H 1011 Tensile, CHS 0000.2, EGL 1.75, CSA 1.8750 SR
Low Rate Biaxial Tensile



STAGE 1 WING 9X TP-H 1011 TENSILE. CHS 0000.2, EGL 1.75, CSA 1.8750 SP

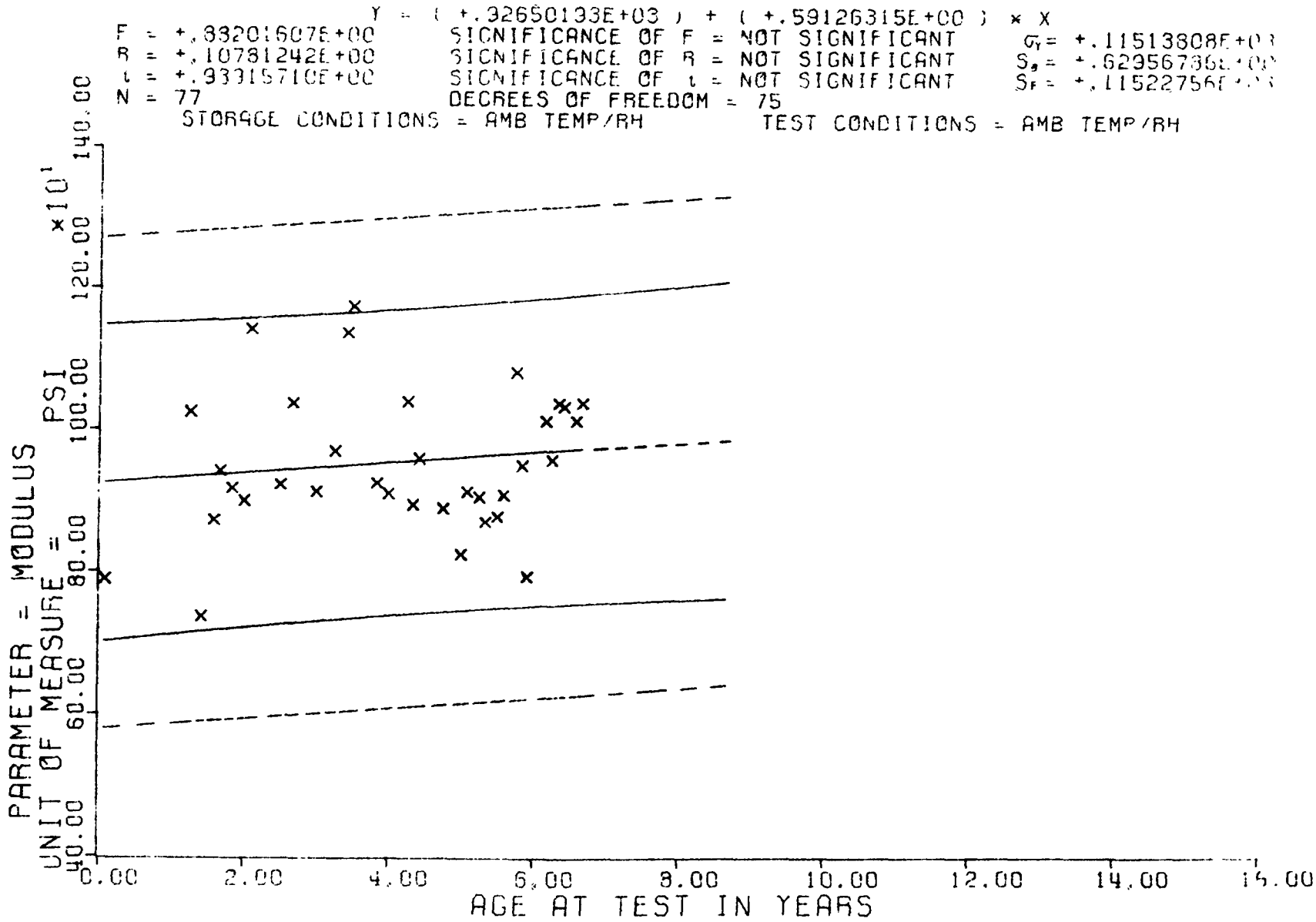
LOW RATE BIAXIAL TENSILE

Figure 9

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
1.0	1	32.0	2	53.0	2	70.0	2
15.0	2	36.0	2	57.0	2	71.0	2
17.0	2	39.0	4	60.0	2	74.0	2
19.0	2	41.0	2	61.0	2	75.0	4
20.0	2	42.0	2	63.0	2	76.0	2
22.0	2	46.0	2	64.0	2	77.0	2
24.0	2	48.0	2	66.0	2	79.0	2
25.0	2	51.0	2	67.0	4	80.0	2
30.0	2	52.0	2	69.0	4		77

Stage 1 Wing 6, TP-H 1011 Tensile, CHS 0000.2, EGL 1.75, CSA 1.8750 MD
Low Rate Biaxial Tensile



STAGE I WING 9, TP-H 1011 TENSILE, CHS 0000.2, EGL 1.75, CSA 1.8750 M²

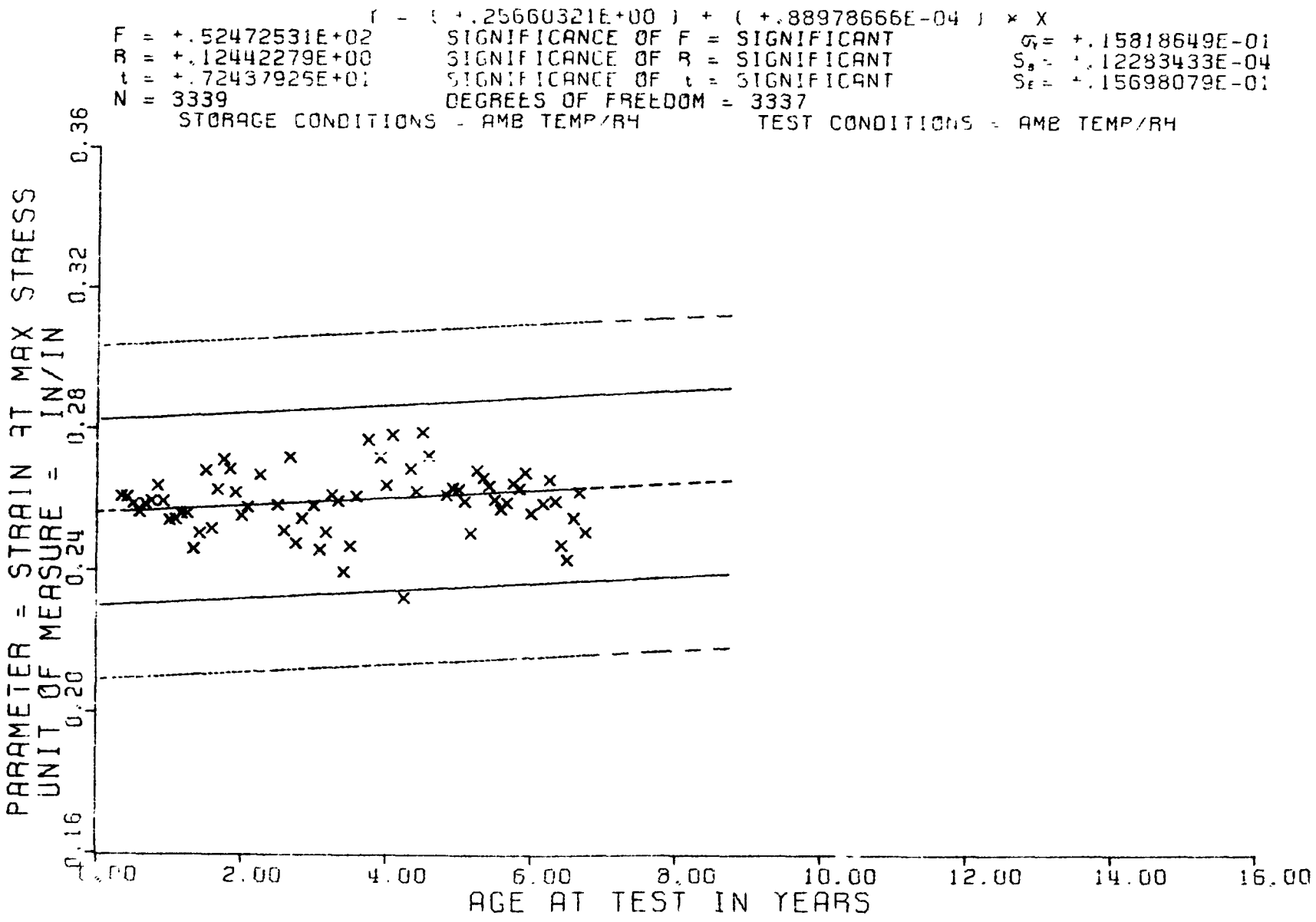
LOW RATE BIAXIAL TENSILE

Figure 10

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
4.0	57	22.0	5	45.0	15	67.0	25
5.0	151	23.0	10	47.0	60	68.0	20
6.0	191	24.0	15	48.0	15	69.0	55
7.0	171	25.0	18	49.0	30	70.0	45
8.0	140	27.0	15	51.0	2	71.0	18
9.0	185	30.0	10	52.0	45	72.0	20
10.0	183	31.0	5	53.0	10	74.0	25
11.0	192	32.0	15	54.0	5	75.0	30
12.0	184	33.0	15	55.0	14	76.0	15
13.0	180	34.0	15	58.0	15	77.0	15
14.0	201	36.0	30	59.0	10	78.0	5
15.0	185	37.0	15	60.0	40	79.0	10
16.0	167	38.0	14	61.0	25	80.0	14
17.0	112	39.0	20	62.0	15	81.0	5
18.0	18	40.0	10	63.0	59		3,339
19.0	25	41.0	5	64.0	24		
20.0	4	42.0	10	65.0	5		
21.0	15	43.0	30	66.0	30		

Stage 1 Wing 6, TP-H 1011 Tensile, CHS 2.0000. EGL 3.00. CSA 0.1875 EM
Low Rate Tensile

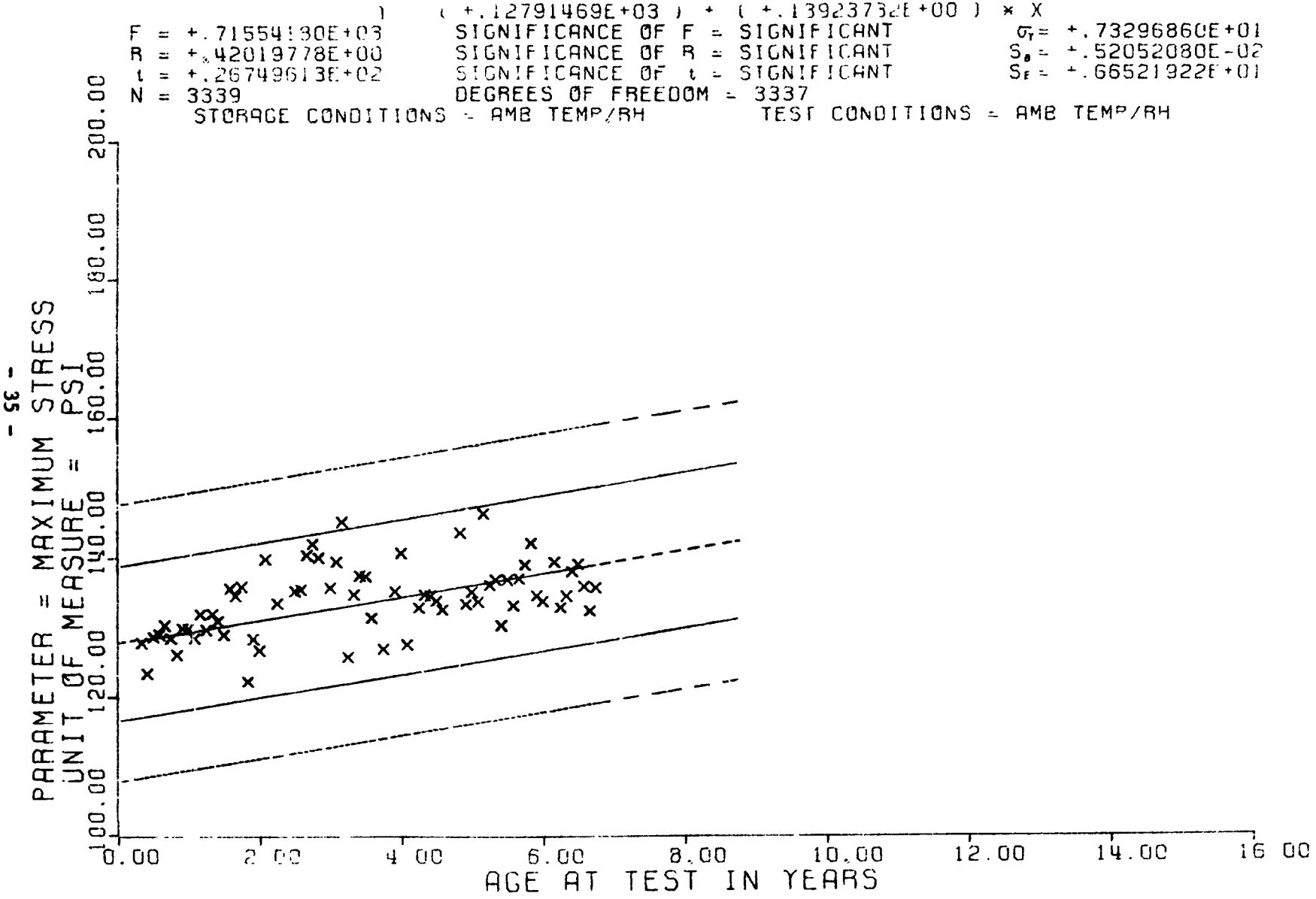


LOW RATE TENSILE
Figure 11

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
4.0	57	22.0	5	45.0	15	67.0	25
5.0	151	23.0	10	47.0	60	68.0	20
6.0	191	24.0	15	48.0	15	69.0	55
7.0	171	25.0	18	49.0	30	70.0	45
8.0	140	27.0	15	51.0	2	71.0	18
9.0	185	30.0	10	52.0	45	72.0	20
10.0	183	31.0	5	53.0	10	74.0	25
11.0	192	32.0	15	54.0	5	75.0	30
12.0	184	33.0	15	55.0	14	76.0	15
13.0	180	34.0	15	58.0	15	77.0	15
14.0	201	36.0	30	59.0	10	78.0	5
15.0	185	37.0	15	60.0	40	79.0	10
16.0	167	38.0	14	61.0	25	80.0	14
17.0	112	39.0	20	62.0	15	81.0	5
18.0	18	40.0	10	63.0	59		3,339
19.0	25	41.0	5	64.0	24		
20.0	4	42.0	10	65.0	5		
21.0	15	43.0	30	66.0	30		

Stage 1, Wing 6, TP-H 1011 Tensile, CHS 2.0000, EGL 3.00, CSA 0.1875 SM
Low Rate Tensile



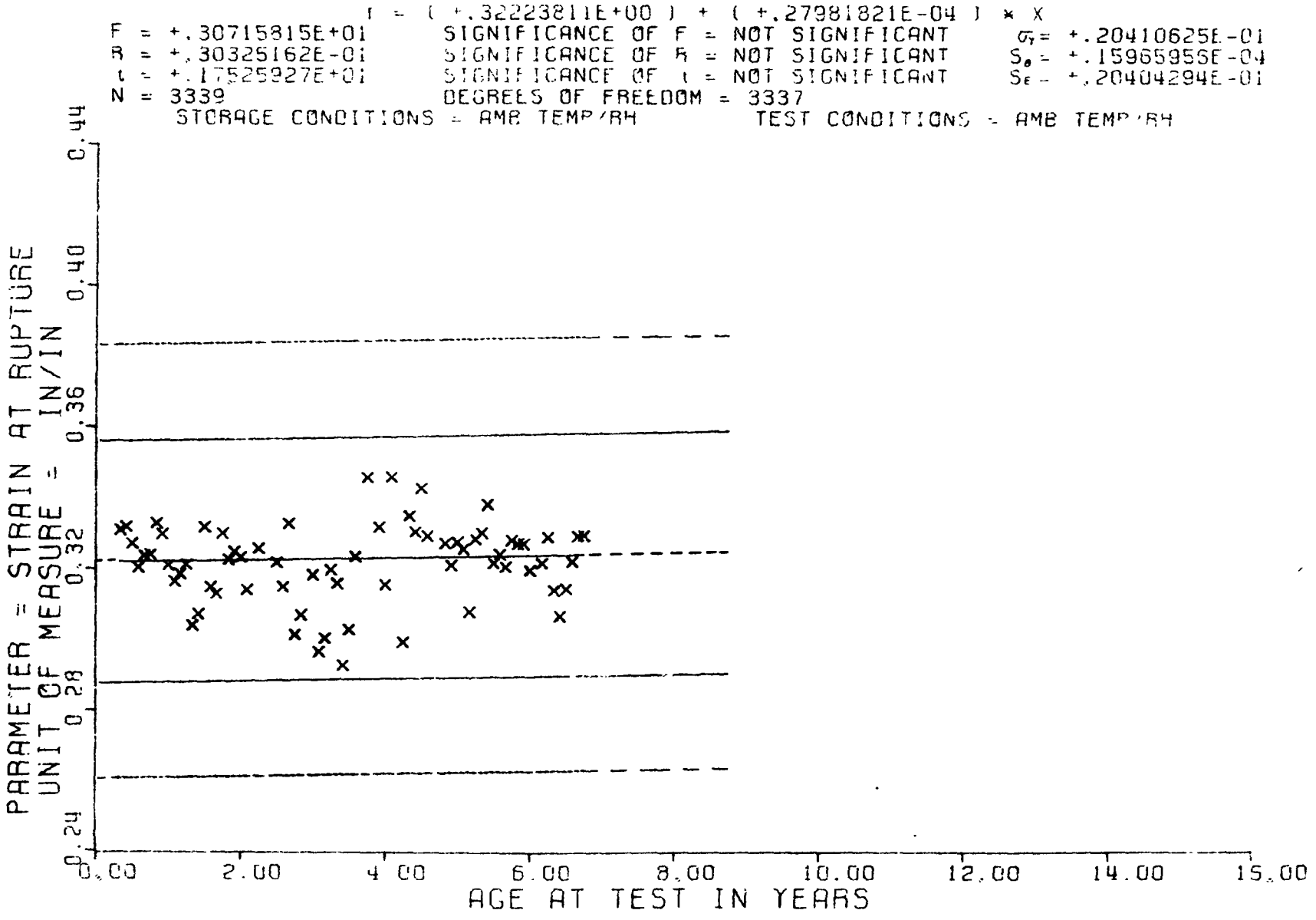
LOW RATE TENSILE

Figure 12

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
4.0	57	22.0	5	45.0	15	67.0	25
5.0	151	23.0	10	47.0	60	68.0	20
6.0	191	24.0	15	48.0	15	69.0	55
7.0	171	25.0	18	49.0	30	70.0	45
8.0	140	27.0	15	51.0	2	71.0	18
9.0	185	30.0	10	52.0	45	72.0	20
10.0	183	31.0	5	53.0	10	74.0	25
11.0	192	32.0	15	54.0	5	75.0	30
12.0	184	33.0	15	55.0	14	76.0	15
13.0	180	34.0	15	58.0	15	77.0	15
14.0	201	36.0	30	59.0	10	78.0	5
15.0	185	37.0	15	60.0	40	79.0	10
16.0	167	38.0	14	61.0	25	80.0	14
17.0	112	39.0	20	62.0	15	81.0	5
18.0	18	40.0	10	63.0	59		3,339
19.0	25	41.0	5	64.0	24		
20.0	4	42.0	10	65.0	5		
21.0	15	43.0	30	66.0	30		

Stage 1, Wing 6, TP-H 1011 Tensile, CHS 2.0000, EGL 3.00, CSA 0.1875 ER
Low Rate Tensile



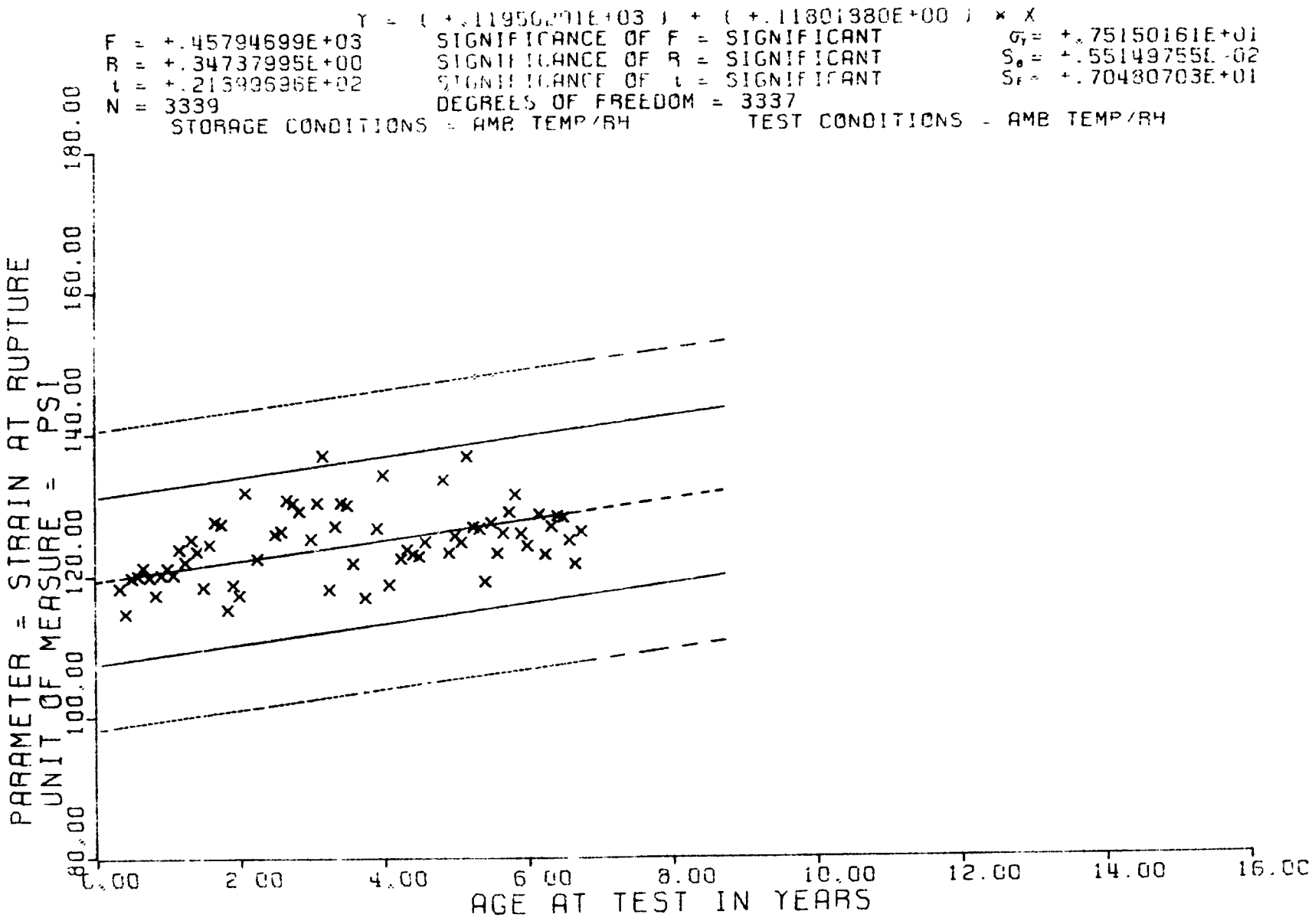
LOW RATE TENSILE

Figure 13

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
4.0	57	22.0	5	45.0	15	67.0	25
5.0	151	23.0	10	47.0	60	68.0	20
6.0	191	24.0	15	48.0	15	69.0	55
7.0	171	25.0	18	49.0	30	70.0	45
8.0	140	27.0	15	51.0	2	71.0	18
9.0	185	30.0	10	52.0	45	72.0	20
10.0	183	31.0	5	53.0	10	74.0	25
11.0	192	32.0	15	54.0	5	75.0	30
12.0	184	33.0	15	55.0	14	76.0	15
13.0	180	34.0	15	58.0	15	77.0	15
14.0	201	36.0	30	59.0	10	78.0	5
15.0	185	37.0	15	60.0	40	79.0	10
16.0	167	38.0	14	61.0	25	80.0	14
17.0	112	39.0	20	62.0	15	81.0	5
18.0	18	40.0	10	63.0	59		3,339
19.0	25	41.0	5	64.0	24		
20.0	4	42.0	10	65.0	5		
21.0	15	43.0	30	66.0	30		

Stage 1 Wing 6, TP-H 1011 Tensile, CHS 2.0000, EGL 3.00, CSA 0.1875 SR
Low Rate Tensile



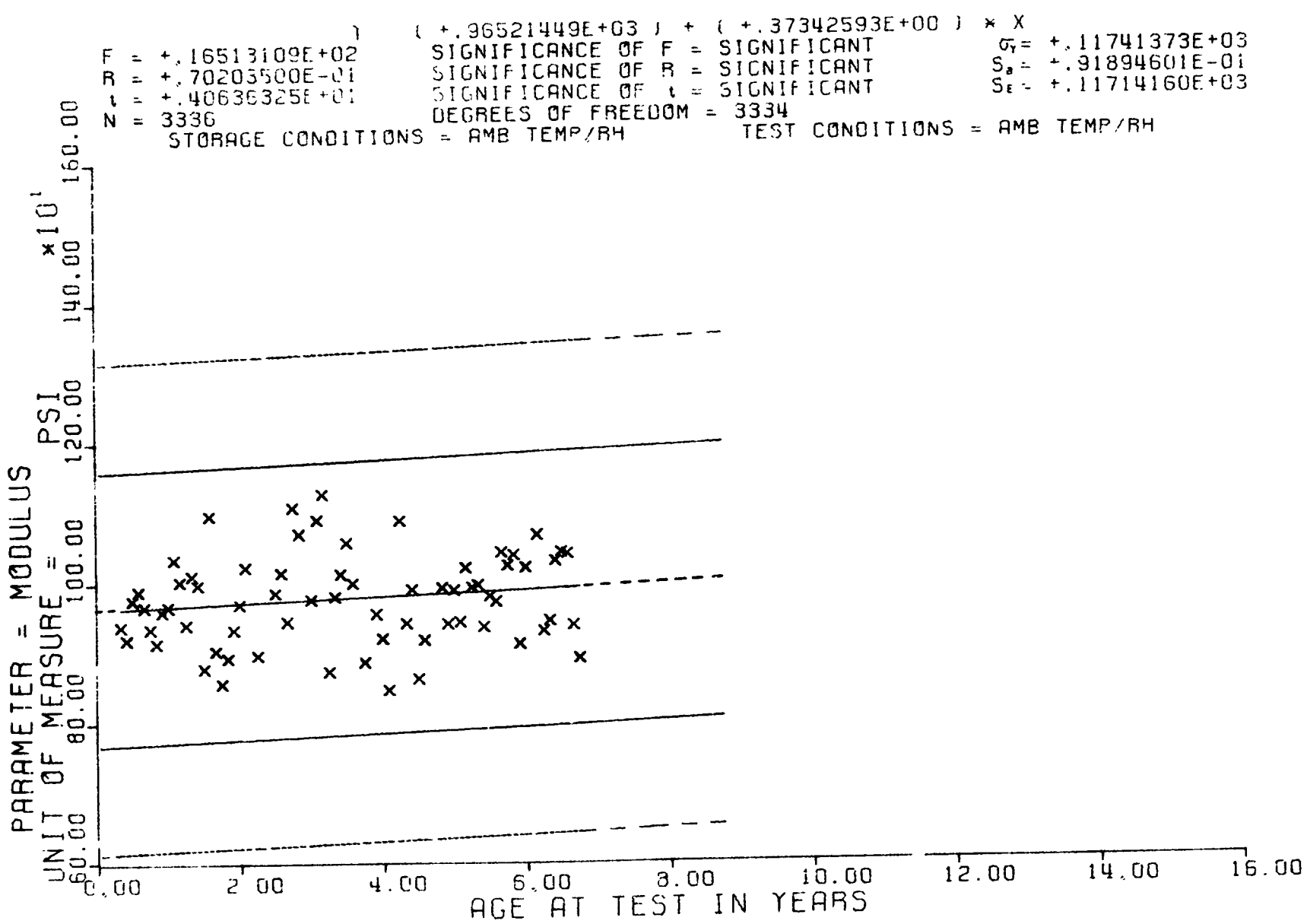
LOW RATE TENSILE

Figure 14

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
4.0	57	22.0	5	45.0	15	67.0	24
5.0	151	23.0	10	47.0	60	68.0	20
6.0	191	24.0	15	48.0	15	69.0	55
7.0	171	25.0	18	49.0	30	70.0	45
8.0	140	27.0	15	51.0	2	71.0	15
9.0	185	30.0	10	52.0	45	72.0	20
10.0	183	31.0	5	53.0	10	74.0	25
11.0	192	32.0	15	54.0	5	75.0	30
12.0	184	33.0	15	55.0	14	76.0	15
13.0	180	34.0	15	58.0	15	77.0	15
14.0	201	36.0	30	59.0	10	78.0	5
15.0	185	37.0	15	60.0	40	79.0	10
16.0	167	38.0	15	61.0	25	80.0	14
17.0	112	39.0	20	62.0	15	81.0	5
18.0	18	40.0	10	63.0	59		3,336
19.0	25	41.0	5	64.0	24		
20.0	4	42.0	10	65.0	5		
21.0	15	43.0	30	66.0	30		

Stage 1 Wing 6, TP-H 1011 Tensile, CHS 2.0000, EGL 3.00, CSA 0.1875 MD
Low Rate Tensile



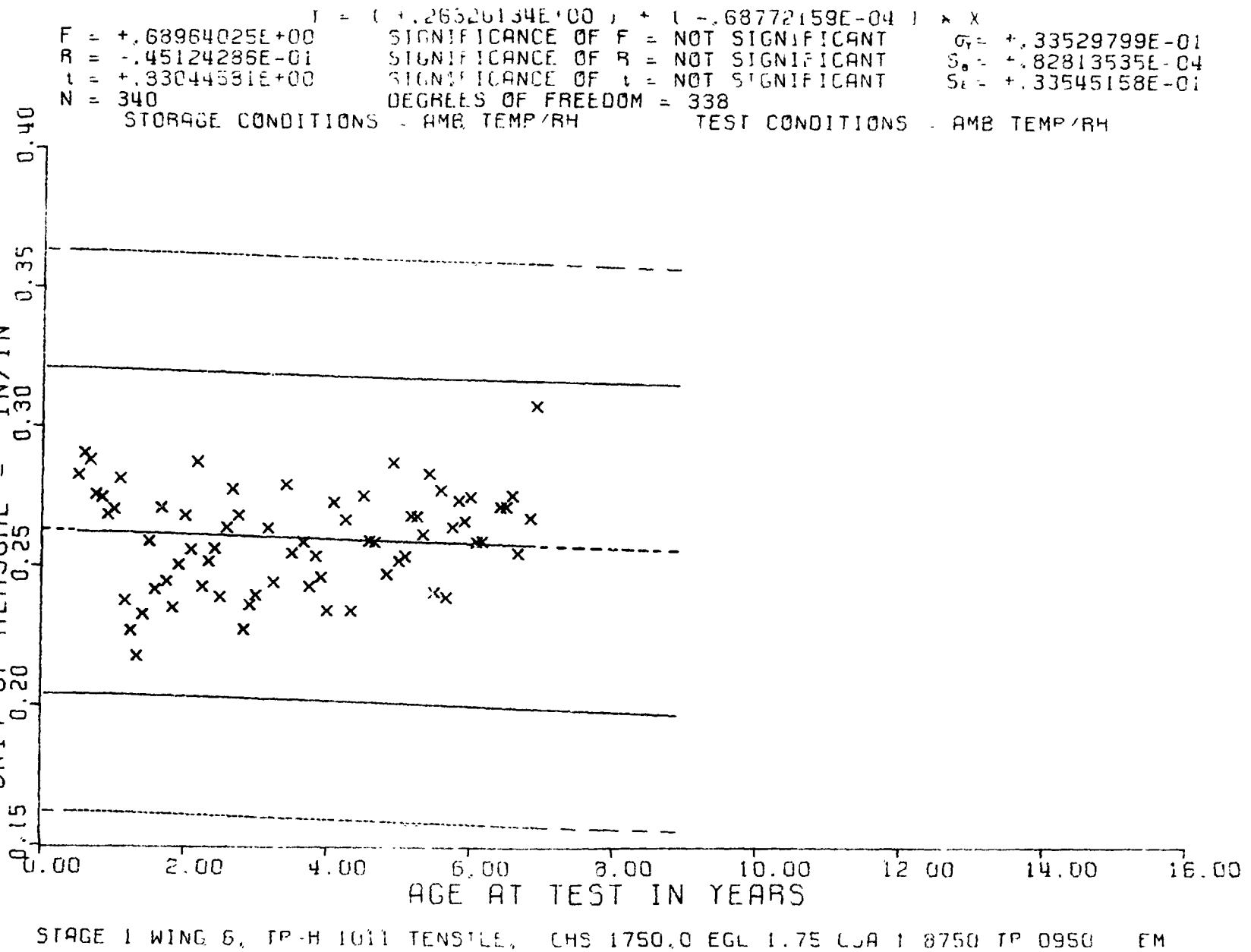
LOW RATE TENSILE

Figure 15

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
6.0	8	24.0	4	45.0	2	66.0	2
7.0	17	25.0	7	46.0	2	67.0	2
8.0	13	26.0	6	47.0	6	68.0	4
9.0	10	27.0	6	48.0	2	69.0	5
10.0	9	28.0	7	49.0	4	70.0	4
11.0	8	29.0	5	51.0	2	71.0	4
12.0	10	30.0	4	52.0	2	72.0	4
13.0	6	31.0	8	54.0	2	73.0	2
14.0	2	32.0	6	55.0	4	74.0	4
15.0	10	33.0	9	56.0	2	77.0	4
16.0	5	34.0	8	58.0	2	78.0	2
17.0	6	35.0	11	59.0	2	79.0	2
18.0	5	36.0	5	60.0	4	80.0	2
19.0	8	38.0	4	61.0	2	82.0	2
20.0	7	39.0	2	62.0	4	83.0	2
21.0	4	41.0	2	63.0	4		340
22.0	6	42.0	4	64.0	4		
23.0	9	44.0	2	65.0	2		

Stage 1 Wing 6, TP-H 1011 Tensile, CHS 1750.0 EGL 1.75 CSA 1.8750 TP 0950 EM
High Rate Triaxial Tensile



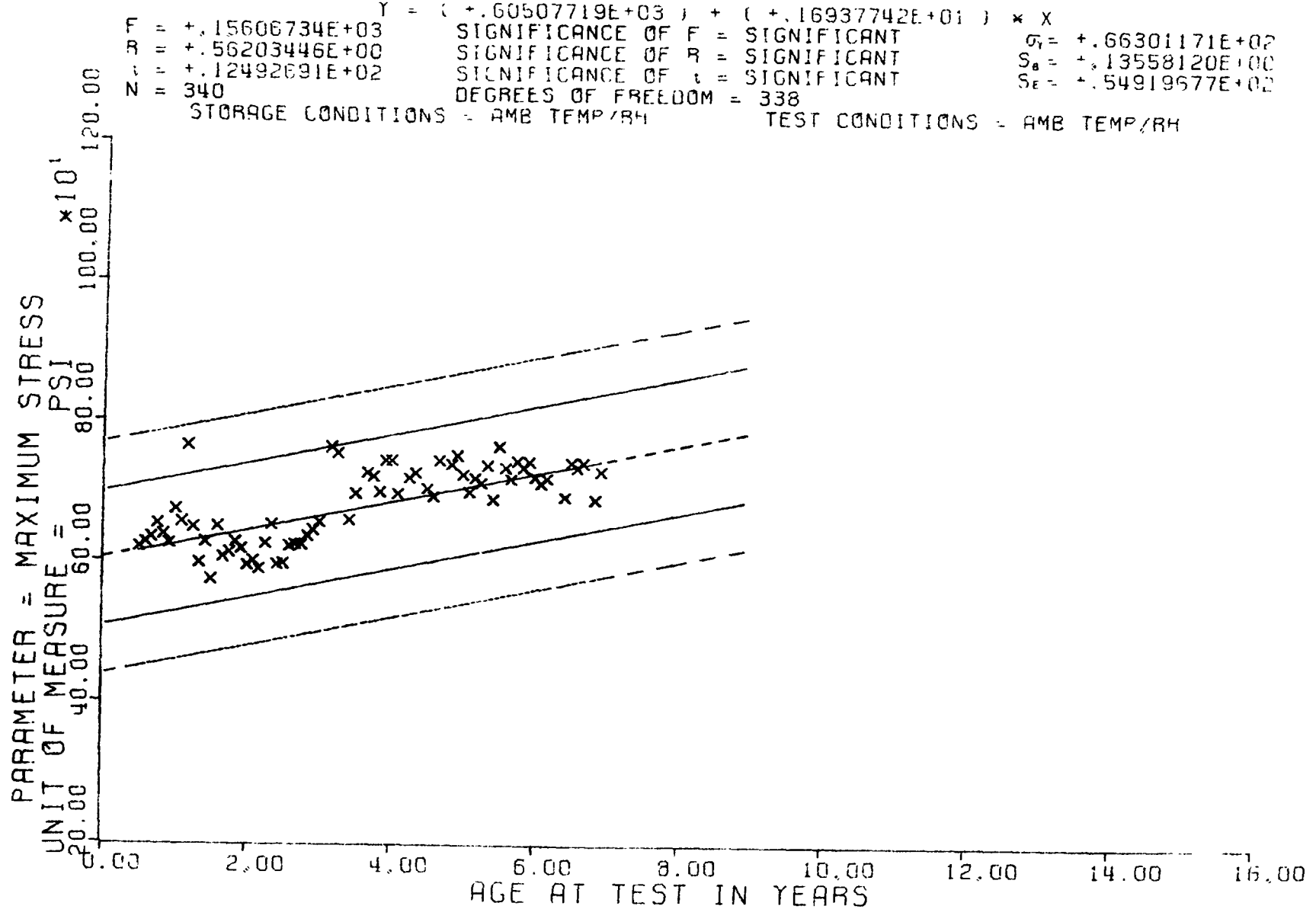
HIGH RATE TRIAXIAL TENSILE

Figure 16

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
6.0	8	24.0	4	45.0	2	66.0	2
7.0	17	25.0	7	46.0	2	67.0	2
8.0	13	26.0	6	47.0	6	68.0	4
9.0	10	27.0	6	48.0	2	69.0	5
10.0	9	28.0	7	49.0	4	70.0	4
11.0	8	29.0	5	51.0	2	71.0	4
12.0	10	30.0	4	52.0	2	72.0	4
13.0	6	31.0	8	54.0	2	73.0	2
14.0	2	32.0	6	55.0	4	74.0	4
15.0	10	33.0	9	56.0	2	77.0	4
16.0	5	34.0	8	58.0	2	78.0	2
17.0	6	35.0	11	59.0	2	79.0	2
18.0	5	36.0	5	60.0	4	80.0	2
19.0	8	38.0	4	61.0	2	82.0	2
20.0	7	39.0	2	62.0	4	83.0	2
21.0	4	41.0	2	63.0	4		340
22.0	6	42.0	4	64.0	4		
23.0	9	44.0	2	65.0	2		
		45					

Stage 1 Wing 6, TP-H 1011 Tensile, CHS 1750.0 EGL 1.75 CSA 1.8750 TP 0950 SM
High Rate Triaxial Tensile



STAGE 1 WING 6, TP-H 1011 TENSILE, CHS 1750.0 EGL 1.75 LSA 1.8750 TP 0950 ,M

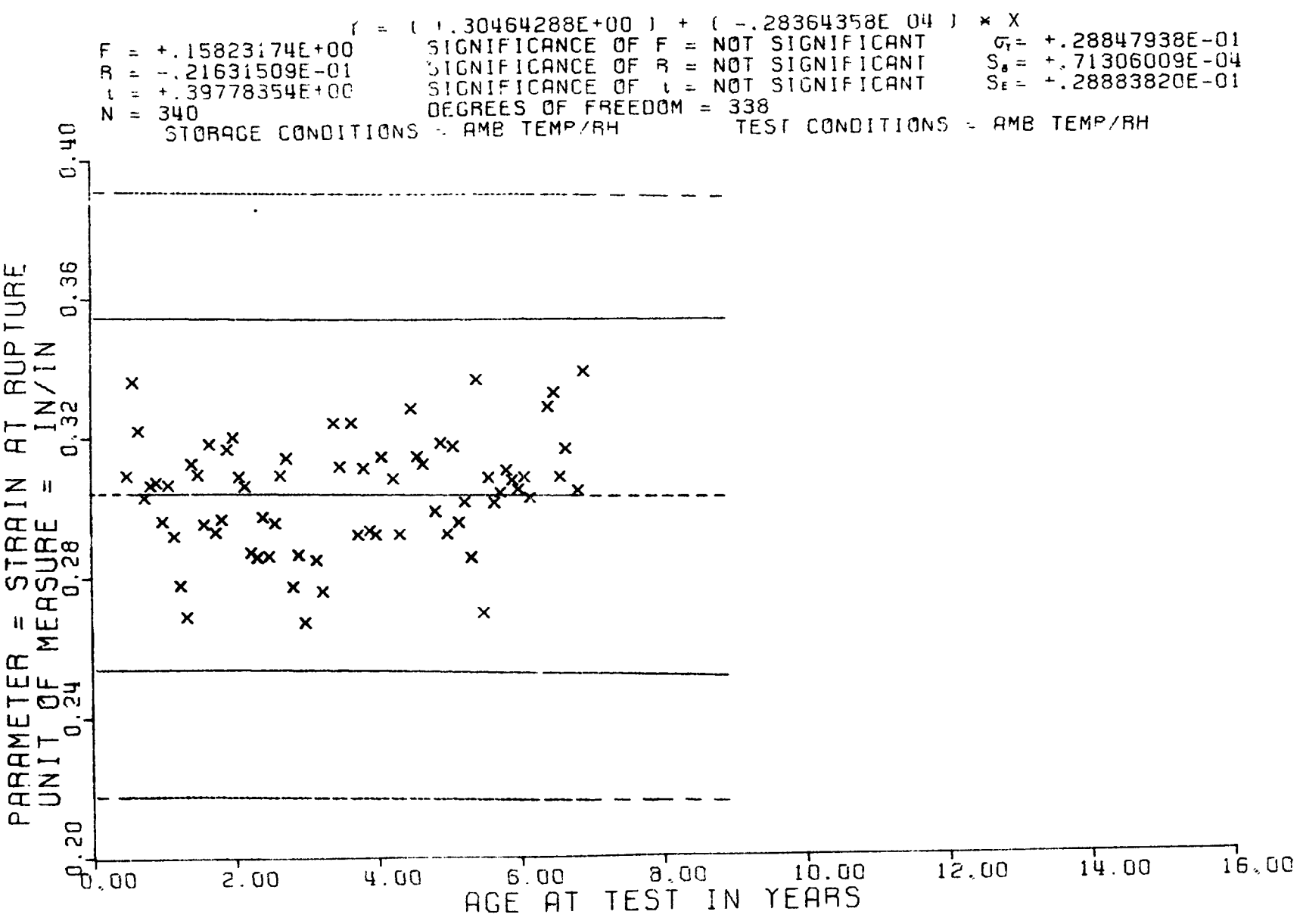
HIGH RATE TRIAXIAL TENSILE

Figure 17

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
6.0	8	24.0	4	45.0	2	66.0	2
7.0	17	25.0	7	46.0	2	67.0	2
8.0	13	26.0	6	47.0	6	68.0	4
9.0	10	27.0	6	48.0	2	69.0	5
10.0	9	28.0	7	49.0	4	70.0	4
11.0	8	29.0	5	51.0	2	71.0	4
12.0	10	30.0	4	52.0	2	72.0	4
13.0	6	31.0	8	54.0	2	73.0	2
14.0	2	32.0	6	55.0	4	74.0	4
15.0	10	33.0	9	56.0	2	77.0	4
16.0	5	34.0	8	58.0	2	78.0	2
17.0	6	35.0	11	59.0	2	79.0	2
18.0	5	36.0	5	60.0	4	80.0	2
19.0	8	38.0	4	61.0	2	82.0	2
20.0	7	39.0	2	62.0	4	83.0	2
21.0	4	41.0	2	63.0	4		340
22.0	6	42.0	4	64.0	4		
23.0	9	44.0	2	65.0	2		

Stage 1 Wing 6, TP-H 1011 Tensile, CSH 1750.0 EGL 1.75 CSA 1.8750 TP 0950 ER
High Rate Triaxial Tensile



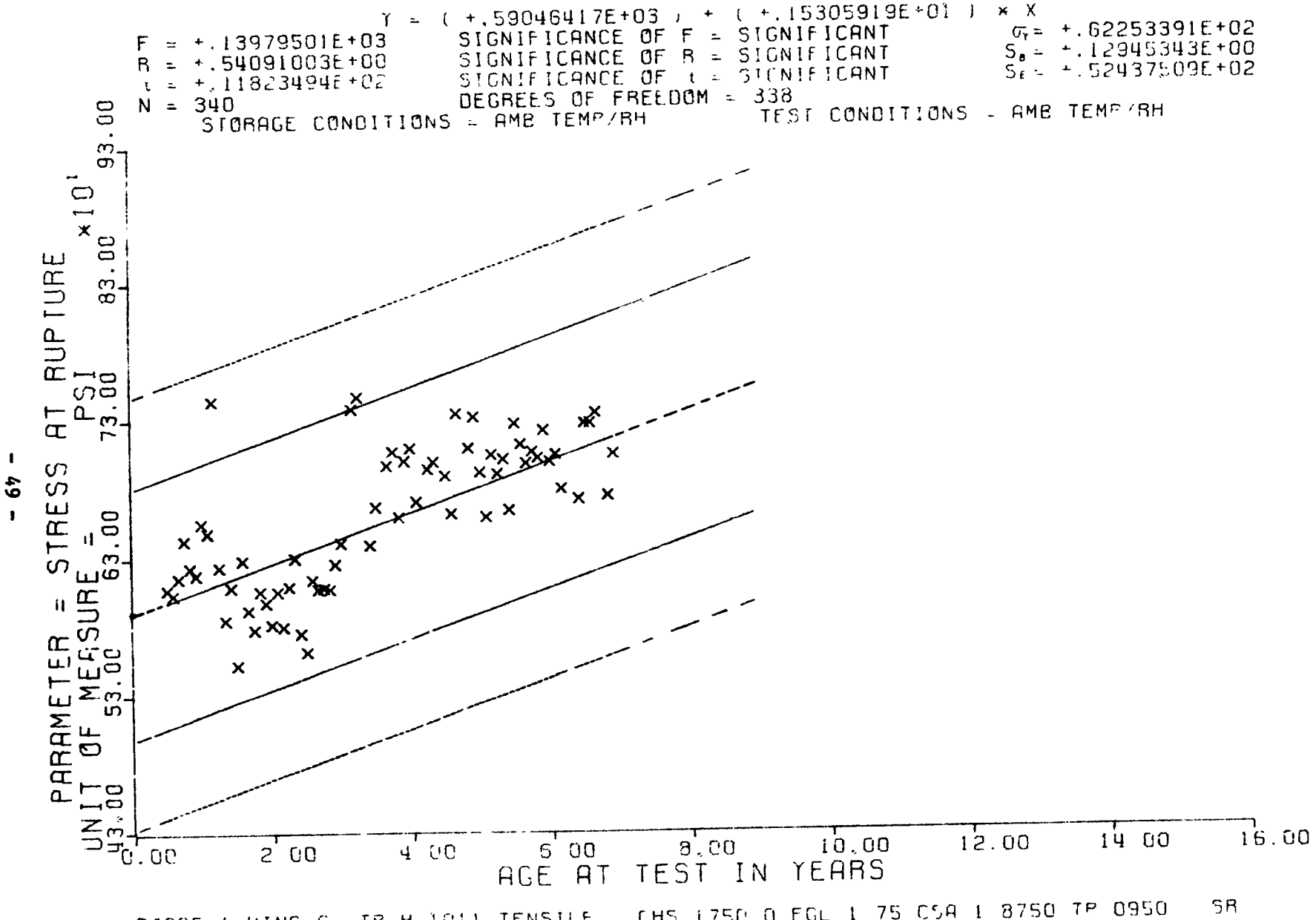
HIGH RATE TRIAXIAL TENSILE

Figure 18

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
6.0	8	24.0	4	45.0	2	66.0	2
7.0	17	25.0	7	46.0	2	67.0	2
8.0	13	26.0	6	47.0	6	68.0	4
9.0	10	27.0	6	48.0	2	69.0	5
10.0	9	28.0	7	49.0	4	70.0	4
11.0	8	29.0	5	51.0	2	71.0	4
12.0	10	30.0	4	52.0	2	72.0	4
13.0	6	31.0	8	54.0	2	73.0	2
14.0	2	32.0	6	55.0	4	74.0	4
15.0	10	33.0	9	56.0	2	77.0	4
16.0	5	34.0	8	58.0	2	78.0	2
17.0	6	35.0	11	59.0	2	79.0	2
18.0	5	36.0	5	60.0	4	80.0	2
19.0	8	38.0	4	61.0	2	82.0	2
20.0	7	39.0	2	62.0	4	83.0	2
21.0	4	41.0	2	63.0	4		340
22.0	6	42.0	4	64.0	4		
23.0	9	44.0	2	65.0	2		

Stage 1 Wing 6, TP-H 1011 Tensile, CHS 1750.0 EGL 1.75 CSA 1.8750 TP 0950 SR
High Rate Triaxial Tensile

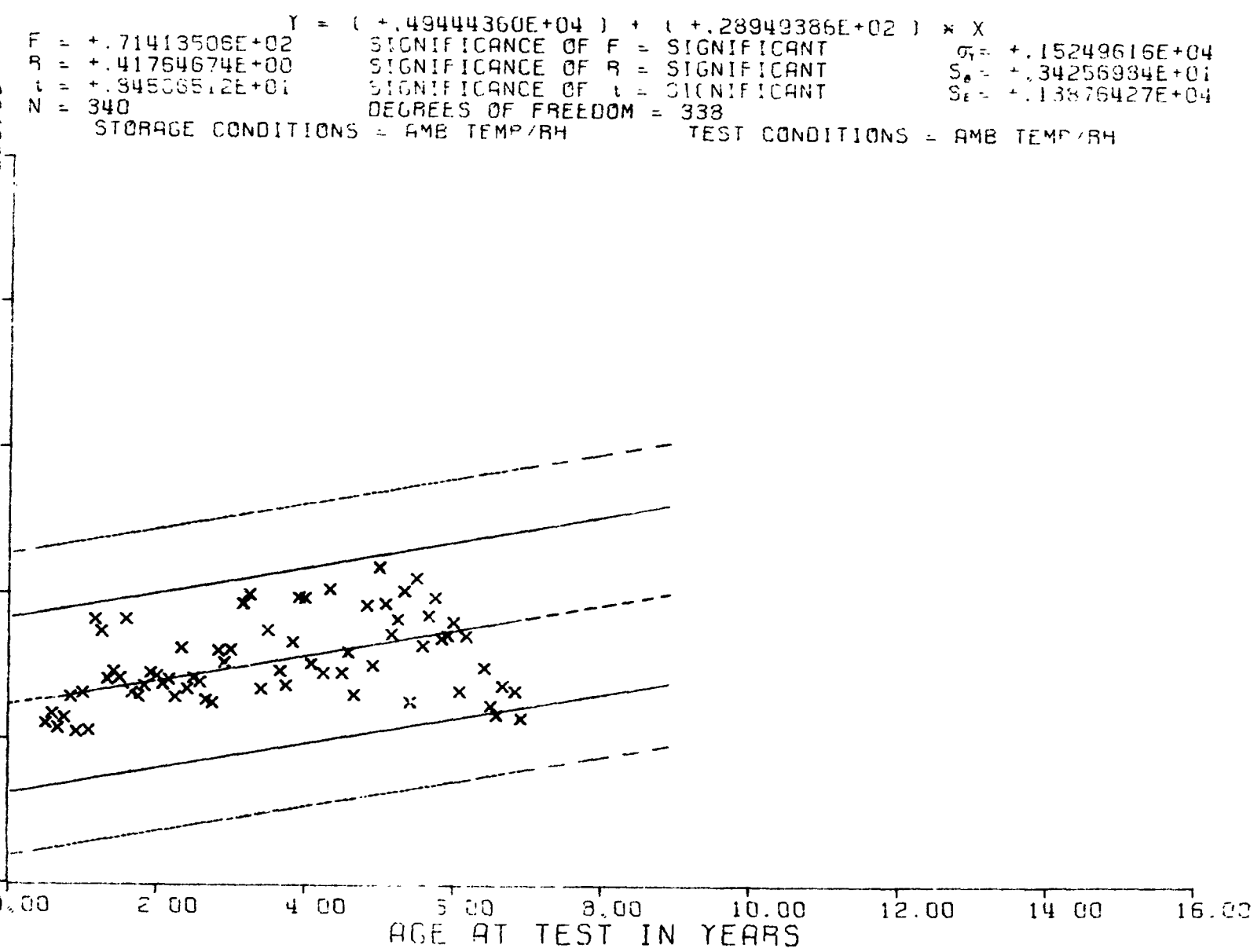


HIGH RATE TRIAXIAL TENSILE
Figure 19

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
6.0	8	24.0	4	45.0	2	66.0	2
7.0	17	25.0	7	46.0	2	67.0	2
8.0	13	26.0	6	47.0	6	68.0	4
9.0	10	27.0	6	48.0	2	69.0	5
10.0	9	28.0	7	49.0	4	70.0	4
11.0	8	29.0	5	51.0	2	71.0	4
12.0	10	30.0	4	52.0	2	72.0	4
13.0	6	31.0	8	54.0	2	73.0	2
14.0	2	32.0	6	55.0	4	74.0	4
15.0	10	33.0	9	56.0	2	77.0	4
16.0	5	34.0	8	58.0	2	78.0	2
17.0	6	35.0	11	59.0	2	79.0	2
18.0	5	36.0	5	60.0	4	80.0	2
19.0	8	38.0	4	61.0	2	82.0	2
20.0	7	39.0	2	62.0	4	83.0	2
21.0	4	41.0	2	63.0	4		340
22.0	6	42.0	4	64.0	4		
23.0	9	44.0	2	65.0	2		

Stage 1 Wing 6, TP-H 1011 Tensile, CHS 1750.0 EGL 1.75 CSA 1.8750 TP 0950 MD
High Rate Triaxial Tensile



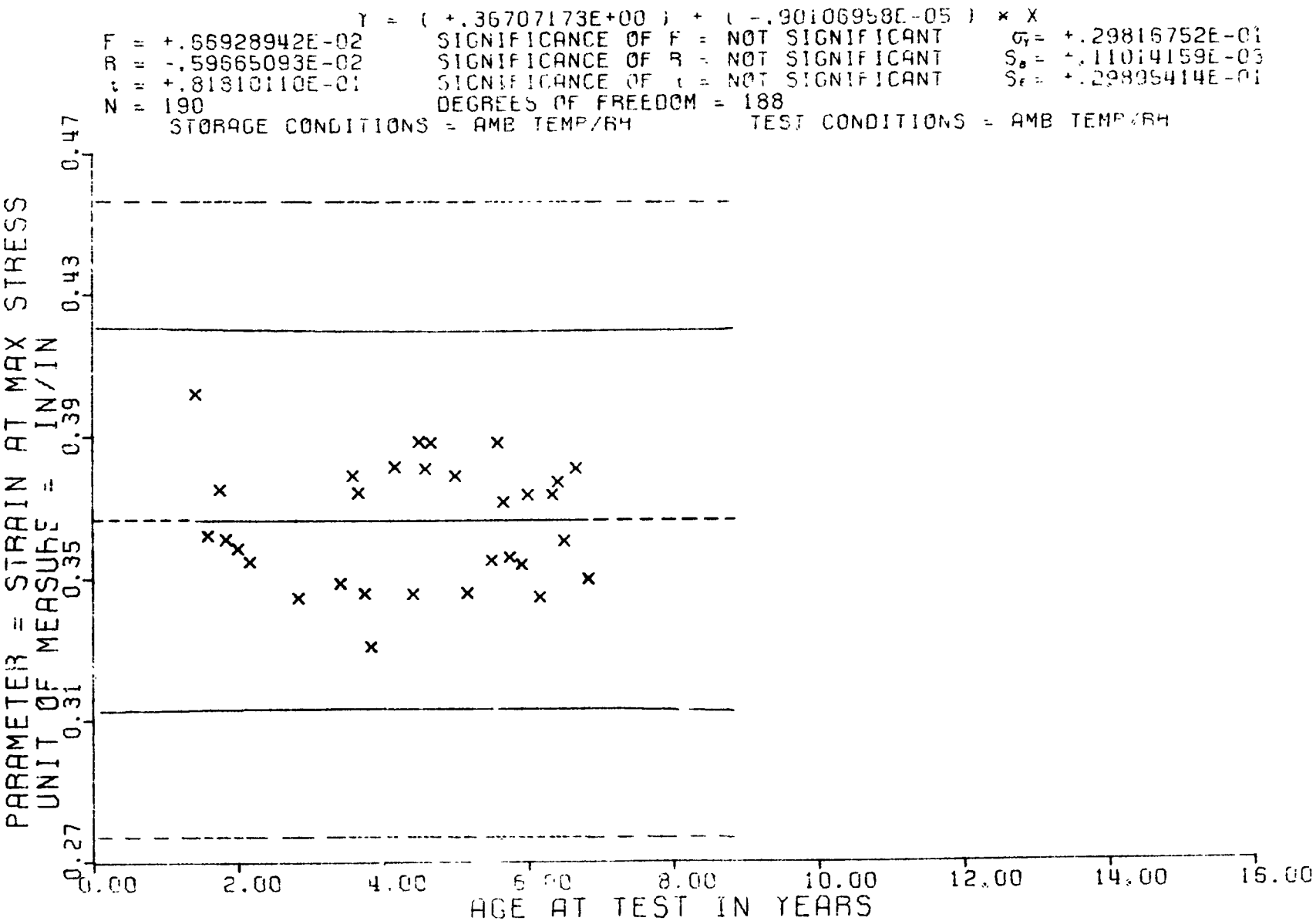
HIGH RATE TRIAXIAL TENSILE

Figure 20

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
17.0	5	44.0	5	62.0	5	77.0	10
19.0	5	45.0	4	66.0	5	78.0	10
21.0	5	46.0	1	67.0	5	80.0	5
22.0	5	50.0	5	68.0	5	82.0	5
24.0	5	53.0	5	69.0	10		190
26.0	10	54.0	10	71.0	10		
34.0	5	55.0	5	72.0	5		
41.0	10	56.0	10	74.0	5		
43.0	5	60.0	5	76.0	5		

Stage 1 Wing 6, TP-H 1011 Tensile, CHS 1750.0 EGL 1.75, CSA 0.1875 TP 0950 EM
Hydrostatic Tensile



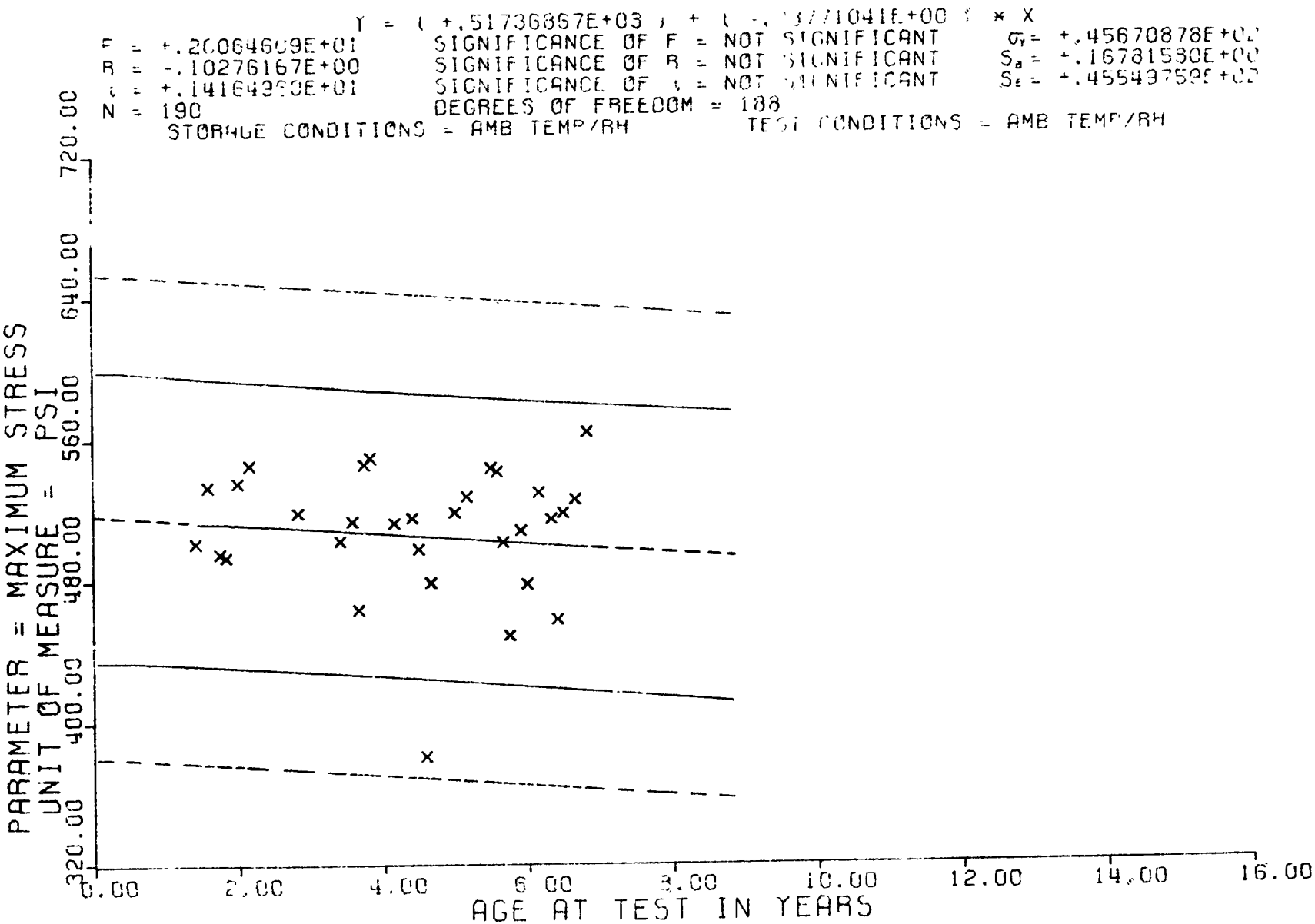
HYDROSTATIC TENSILE

Figure 21

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
17.0	5	44.0	5	62.0	5	77.0	10
19.0	5	45.0	4	66.0	5	78.0	10
21.0	5	46.0	1	67.0	5	80.0	5
22.0	5	50.0	5	68.0	5	82.0	5
24.0	5	53.0	5	69.0	10		190
26.0	10	54.0	10	71.0	10		
34.0	5	55.0	5	72.0	5		
41.0	10	56.0	10	74.0	5		
43.0	5	60.0	5	76.0	5		

Stage 1 Wing 6, TP-H 1011 Tensile, CSH 1750.0 EGL 1.75 CSA 0.1875 TP 0950 SM
Hydrostatic Tensile



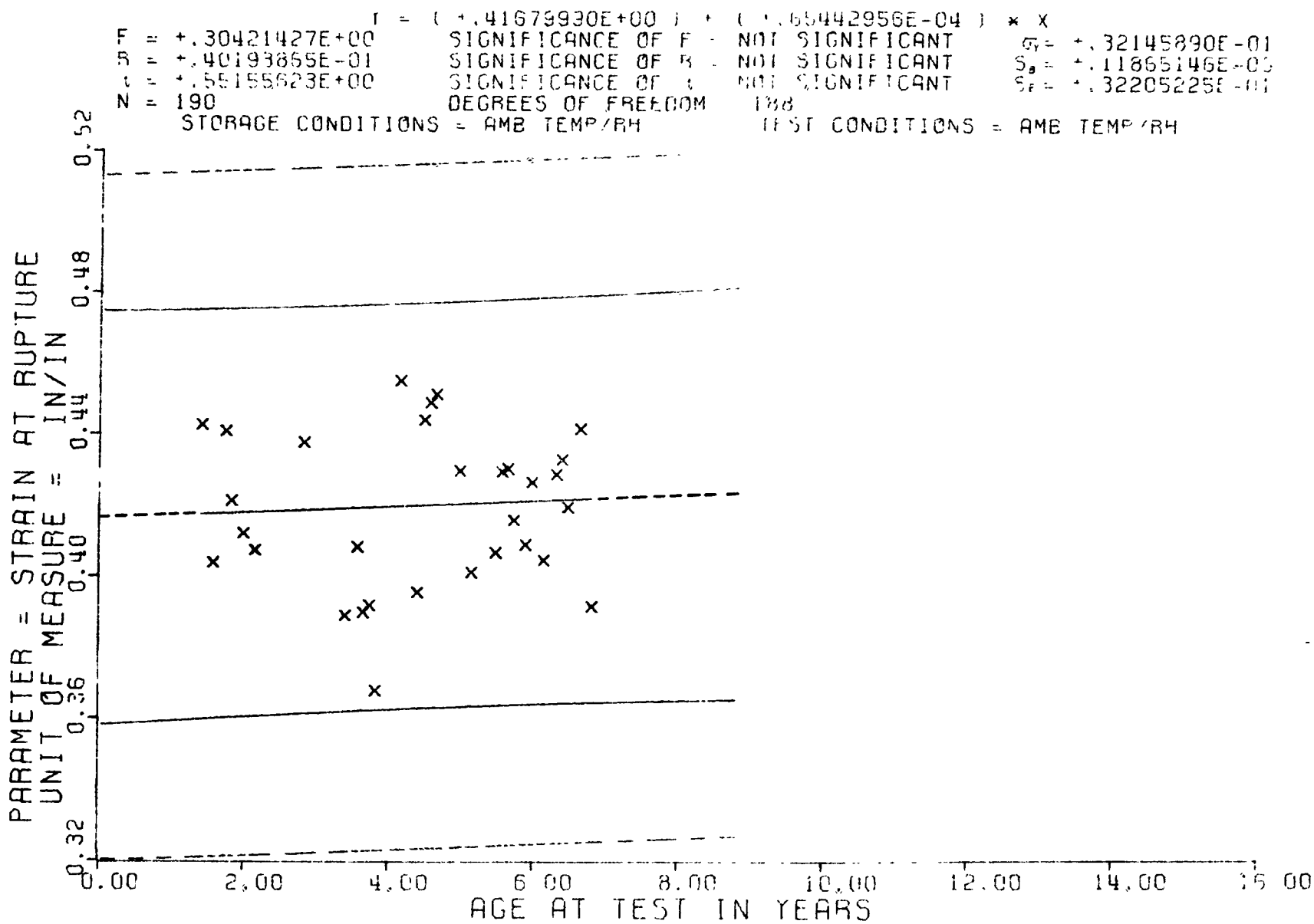
HYDROSTATIC TENSILE

Figure 22

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
17.0	5	44.0	5	62.0	5	77.0	10
19.0	5	45.0	4	66.0	5	78.0	10
21.0	5	46.0	1	67.0	5	80.0	5
22.0	5	50.0	5	68.0	5	82.0	5
24.0	5	53.0	5	69.0	10		190
26.0	10	54.0	10	71.0	10		
34.0	5	55.0	5	72.0	5		
41.0	10	56.0	10	74.0	5		
43.0	5	60.0	5	76.0	5		

Stage 1 Wing 6, TP-H 1011 Tensile, CHS 1750.0 EGL 1.75 CSA 0.1875 TP 0950 ER
Hydrostatic Tensile



STAGE 1 WING G, TP-H 1011 TENSILE, CHS 1750.0 EGI 1.75 CSA 0.1875 TP 0950 EP

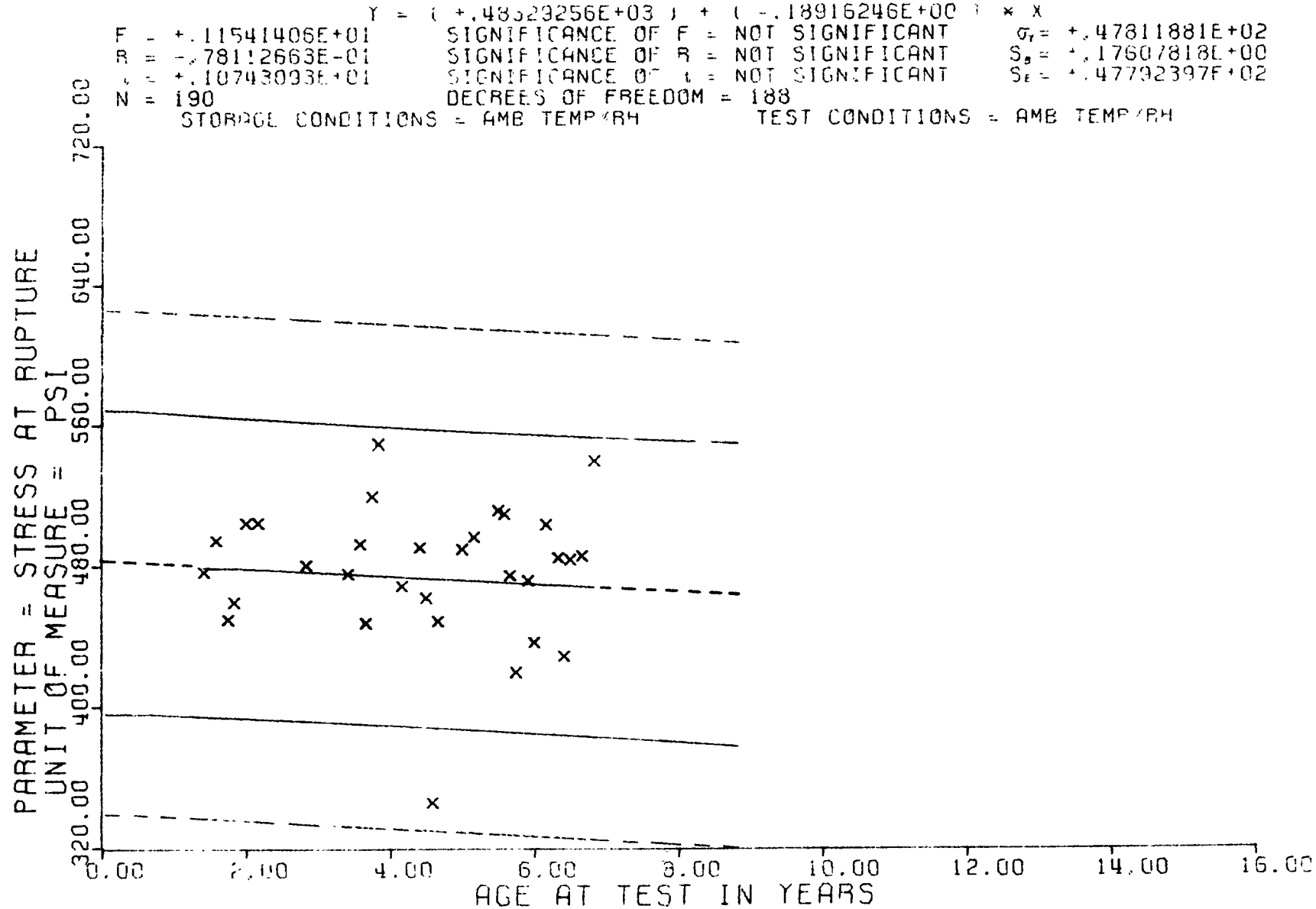
HYDROSTATIC TENSILE

Figure 23

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
17.0	5	44.0	5	62.0	5	77.0	10
19.0	5	45.0	4	66.0	5	78.0	10
21.0	5	46.0	1	67.0	5	80.0	5
22.0	5	50.0	5	68.0	5	82.0	5
24.0	5	53.0	5	69.0	10		190
26.0	10	54.0	10	71.0	10		
34.0	5	55.0	5	72.0	5		
41.0	10	56.0	10	74.0	5		
43.0	5	60.0	5	76.0	5		

Stage 1 Wing 6, TP-H 1011 Tensile, CHS 1750.0 EGL 1.75 CSA 0.1875 TP 0950 SR
Hydrostatic Tensile



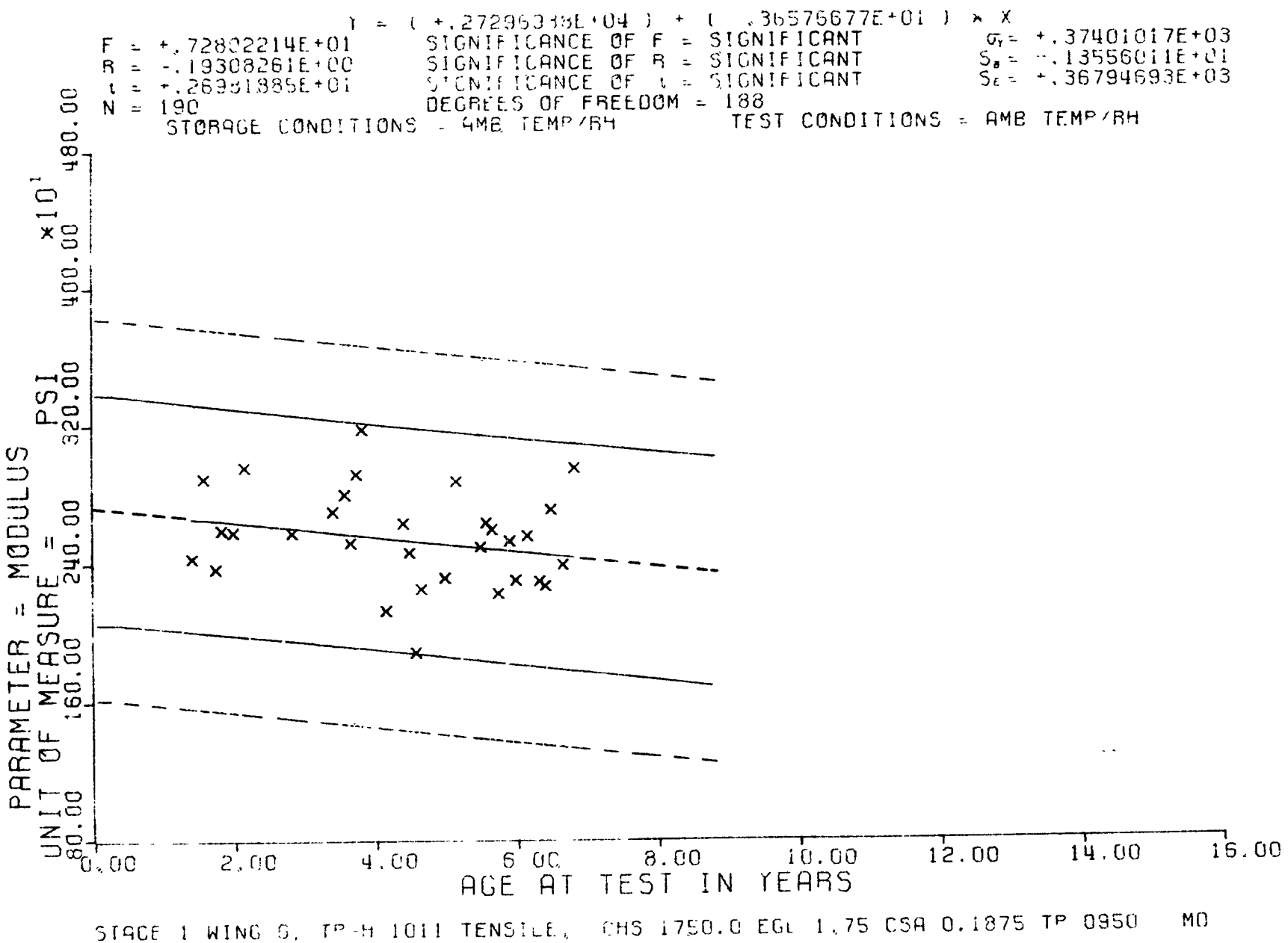
HYDROSTATIC TENSILE

Figure 24

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
17.0	5	44.0	5	62.0	5	77.0	10
19.0	5	45.0	'	66.0	5	78.0	10
21.0	5	46.0	1	67.0	5	80.0	5
22.0	5	50.0	5	68.0	5	82.0	5
24.0	5	53.0	5	69.0	10		190
26.0	10	54.0	10	71.0	10		
34.0	5	55.0	5	72.0	5		
41.0	10	56.0	10	74.0	5		
43.0	5	60.0	5	76.0	5		

Stage 1 Wing 6, TP-H 1011 Tensile, CHS .750.0 EGL 1.75, CSA 0.1875 TP 0950 MD
Hydrostatic Tensile



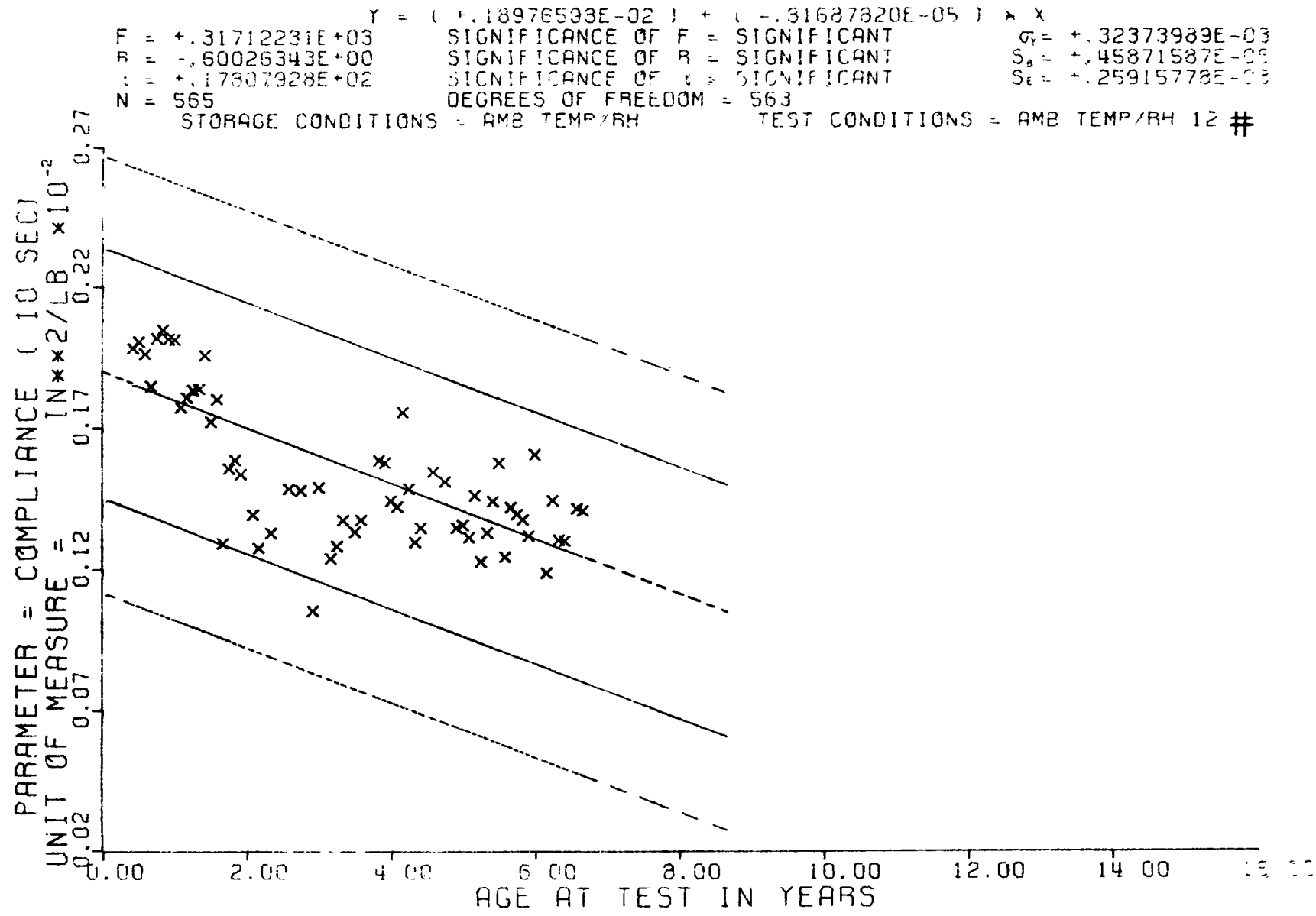
HYDROSTATIC TENSILE

Figure 25

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
5.0	2	23.0	5	51.0	5	72.0	9
6.0	8	25.0	5	52.0	4	74.0	9
7.0	8	26.0	5	53.0	11	75.0	6
8.0	6	28.0	5	55.0	5	76.0	10
9.0	12	31.0	5	57.0	5	77.0	5
10.0	6	33.0	5	59.0	5	79.0	5
11.0	15	35.0	10	60.0	10	80.0	5
12.0	13	36.0	10	61.0	5		565
13.0	25	38.0	5	62.0	14		
14.0	24	39.0	10	63.0	1		
15.0	30	40.0	5	64.0	10		
16.0	27	42.0	5	65.0	15		
17.0	12	43.0	10	66.0	10		
18.0	26	46.0	5	67.0	5		
19.0	11	47.0	5	68.0	15		
20.0	10	48.0	17	69.0	5		
21.0	4	49.0	8	70.0	20		
22.0	1	50.0	5	71.0	6		

Stage 1, Wing 6, TP-H 1011, Creep Compliance at 10 sec, 12 pound Load



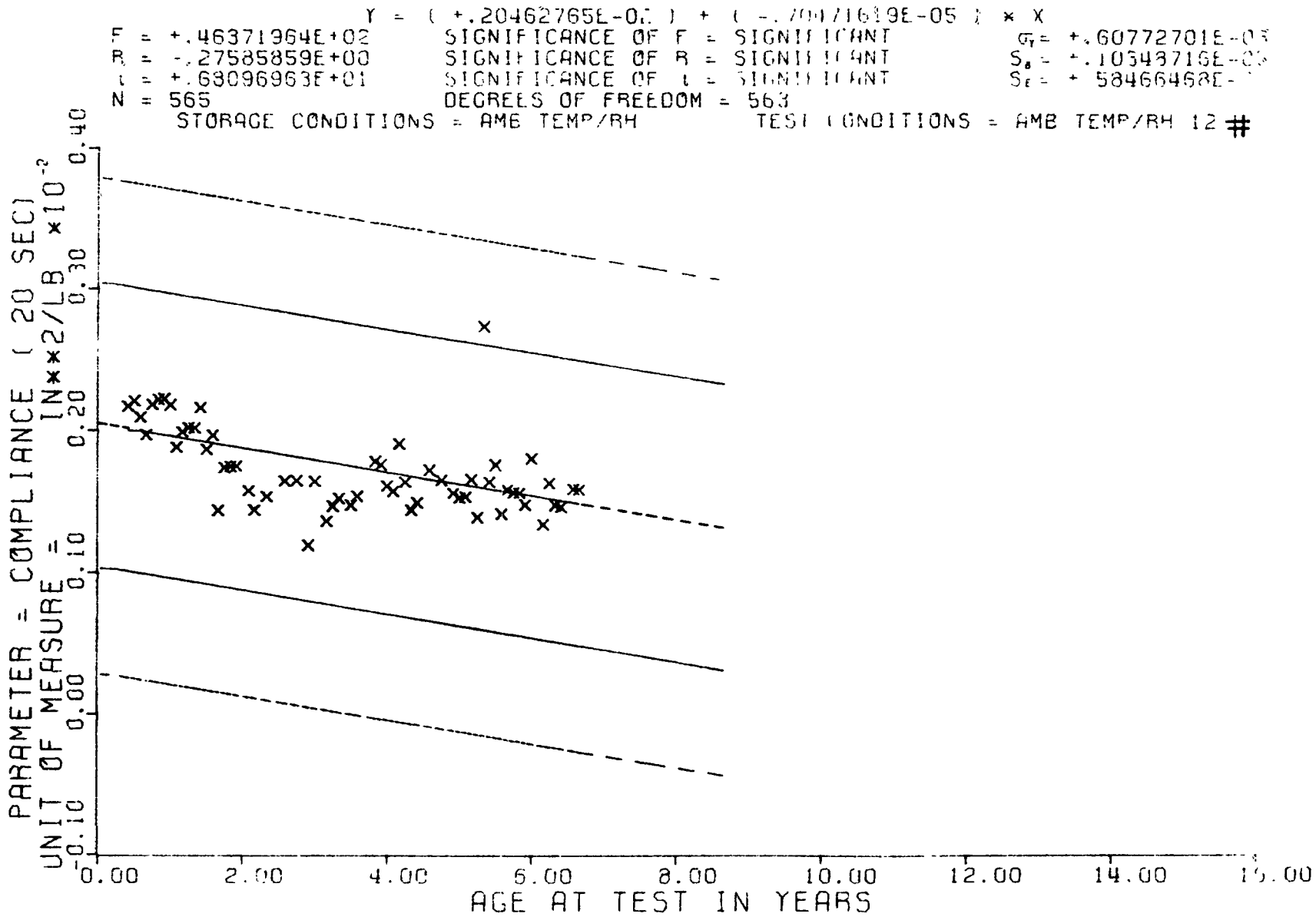
STAGE 1, WING 6 TP H 1031 CREEP COMPLIANCE AT 10 SEC. 12 POUND LOAD

Figure 26

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
5.0	2	23.0	5	51.0	5	72.0	9
6.0	8	25.0	5	52.0	4	74.0	9
7.0	8	26.0	5	53.0	11	75.0	6
8.0	6	28.0	5	55.0	5	76.0	10
9.0	12	31.0	5	57.0	5	77.0	5
10.0	6	33.0	5	59.0	5	79.0	5
11.0	15	35.0	10	60.0	10	80.0	5
12.0	13	36.0	10	61.0	5		565
13.0	25	38.0	5	62.0	14		
14.0	24	39.0	10	63.0	1		
15.0	30	40.0	5	64.0	10		
16.0	27	42.0	5	65.0	15		
17.0	12	43.0	10	66.0	10		
18.0	26	46.0	5	67.0	5		
19.0	11	47.0	5	68.0	15		
20.0	10	48.0	17	69.0	5		
21.0	4	49.0	8	70.0	20		
22.0	1	50.0	5	71.0	6		

Stage 1, Wing 6, TP-H 1011, Creep Compliance at 20 Sec, 12 Pound Load



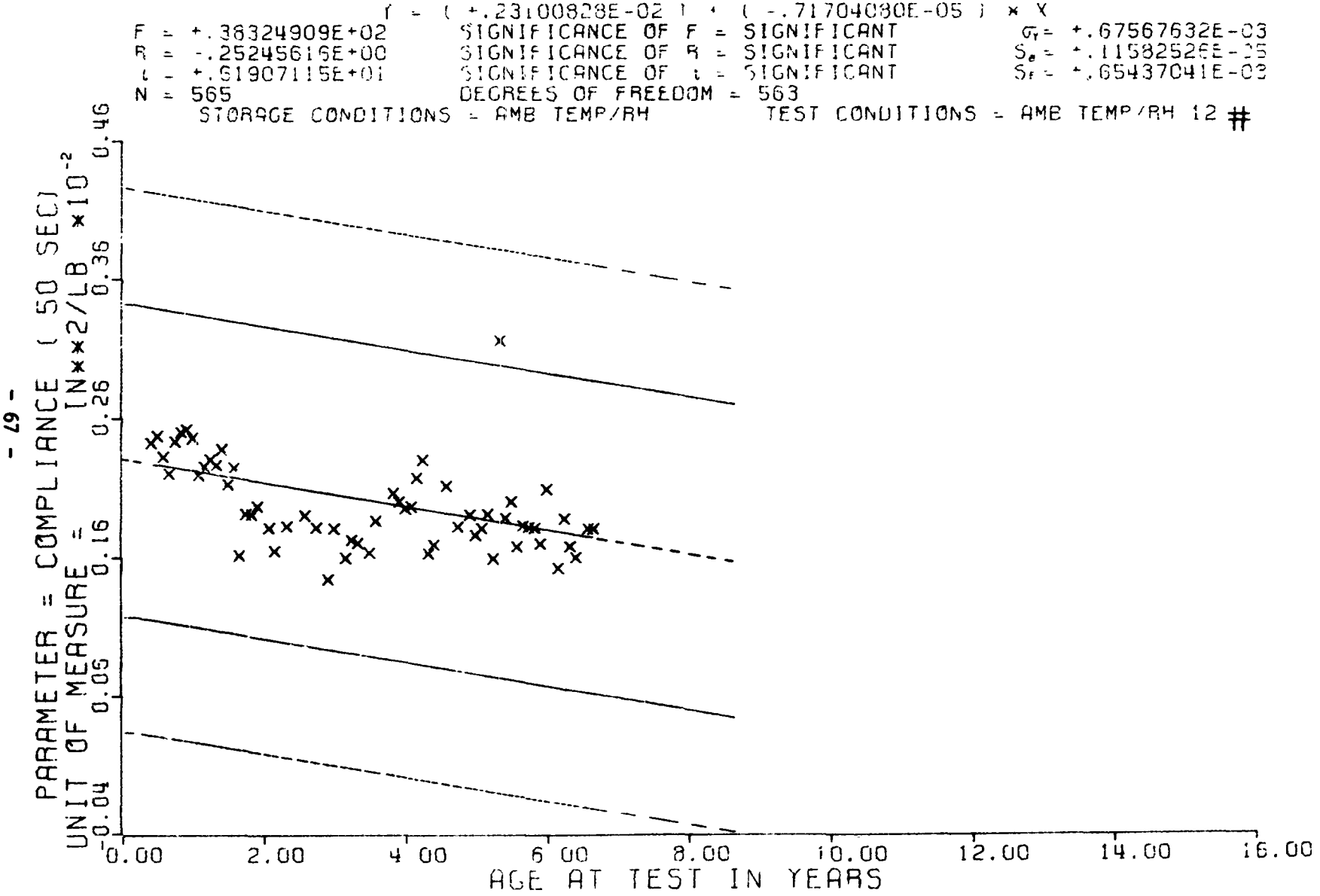
STAGE I, WING G, TP-H 1011, CREEP COMPLIANCE AT 20 SEC, 12 POUND LOAD

Figure 27

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
5.0	2	23.0	5	51.0	5	72.0	9
6.0	8	25.0	5	52.0	4	74.0	9
7.0	8	26.0	5	53.0	11	75.0	6
8.0	6	28.0	5	55.0	5	76.0	10
9.0	12	31.0	5	57.0	5	77.0	5
10.0	6	33.0	5	59.0	5	79.0	5
11.0	15	35.0	10	60.0	10	80.0	5
12.0	13	36.0	10	61.0	5		565
13.0	25	38.0	5	62.0	14		
14.0	24	39.0	10	63.0	1		
15.0	30	40.0	5	64.0	10		
16.0	27	42.0	5	65.0	15		
17.0	12	43.0	10	66.0	10		
18.0	26	46.0	5	67.0	5		
19.0	11	47.0	5	68.0	15		
20.0	10	48.0	17	69.0	5		
21.0	4	49.0	8	70.0	20		
22.0	1	50.0	5	71.0	6		

Stage 1, Wing 6, TP-H 1011, Creep Compliance at 50 Sec, 12 Pound Load



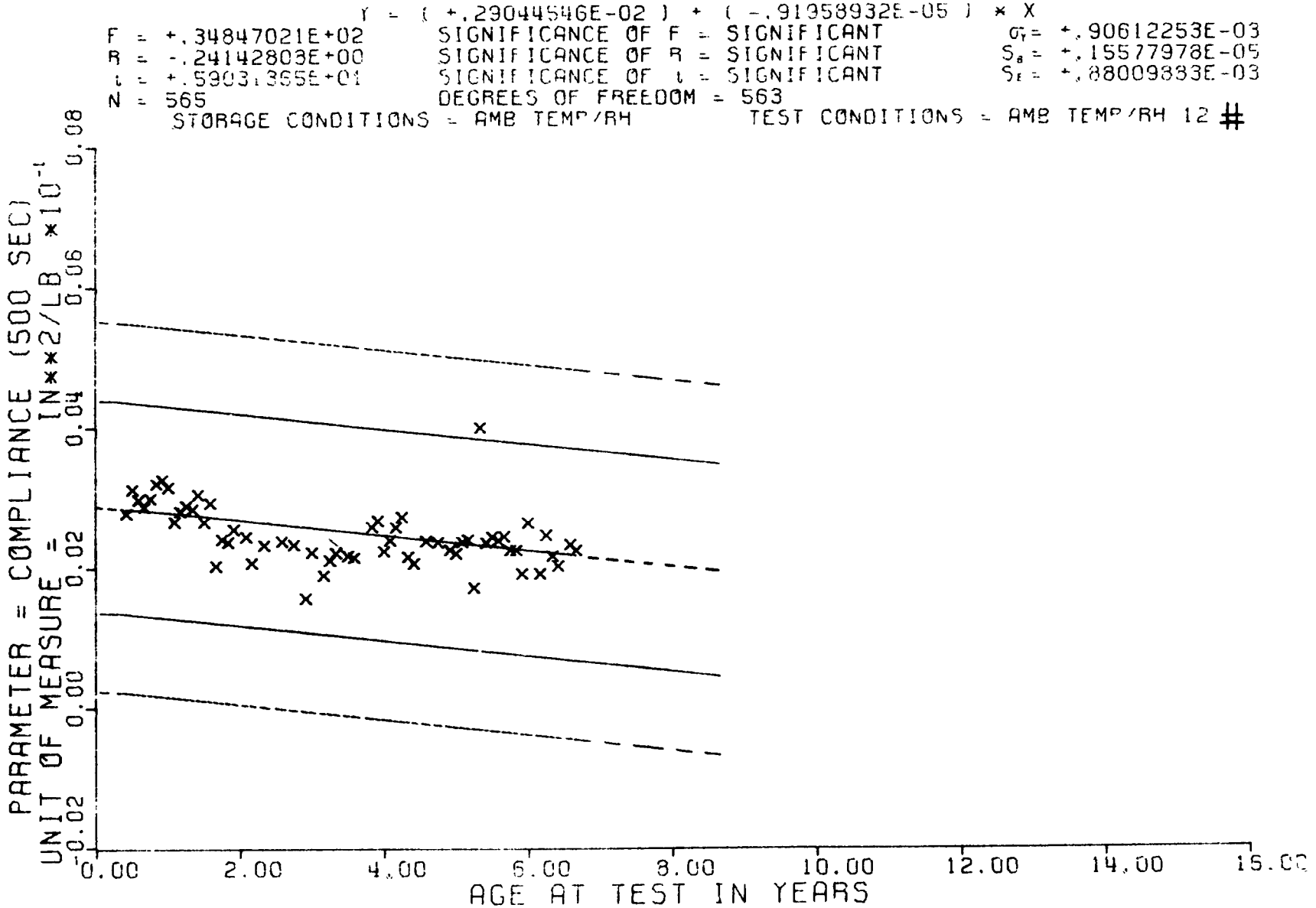
STAGE 1, WING G, TP-H 1011, CREEP COMPLIANCE AT 50 SEC, 12 POUND LOAD

Figure 28

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
5.0	2	23.0	5	51.0	5	72.0	9
6.0	8	25.0	5	52.0	4	74.0	9
7.0	8	26.0	5	53.0	11	75.0	6
8.0	6	28.0	5	55.0	5	76.0	10
9.0	12	31.0	5	57.0	5	77.0	5
10.0	6	33.0	5	59.0	5	79.0	5
11.0	15	35.0	10	60.0	10	80.0	5
12.0	13	36.0	10	61.0	5		565
13.0	25	38.0	5	62.0	14		
14.0	24	39.0	10	63.0	1		
15.0	30	40.0	5	64.0	10		
16.0	27	42.0	5	65.0	15		
17.0	12	43.0	10	66.0	10		
18.0	26	46.0	5	67.0	5		
19.0	11	47.0	5	68.0	15		
20.0	10	48.0	17	69.0	5		
21.0	4	49.0	8	70.0	20		
22.0	1	50.0	5	71.0	6		

Stage 1, Wing 6, TP-H 1011, Creep Compliance at 500 Sec, 12 Pound Load



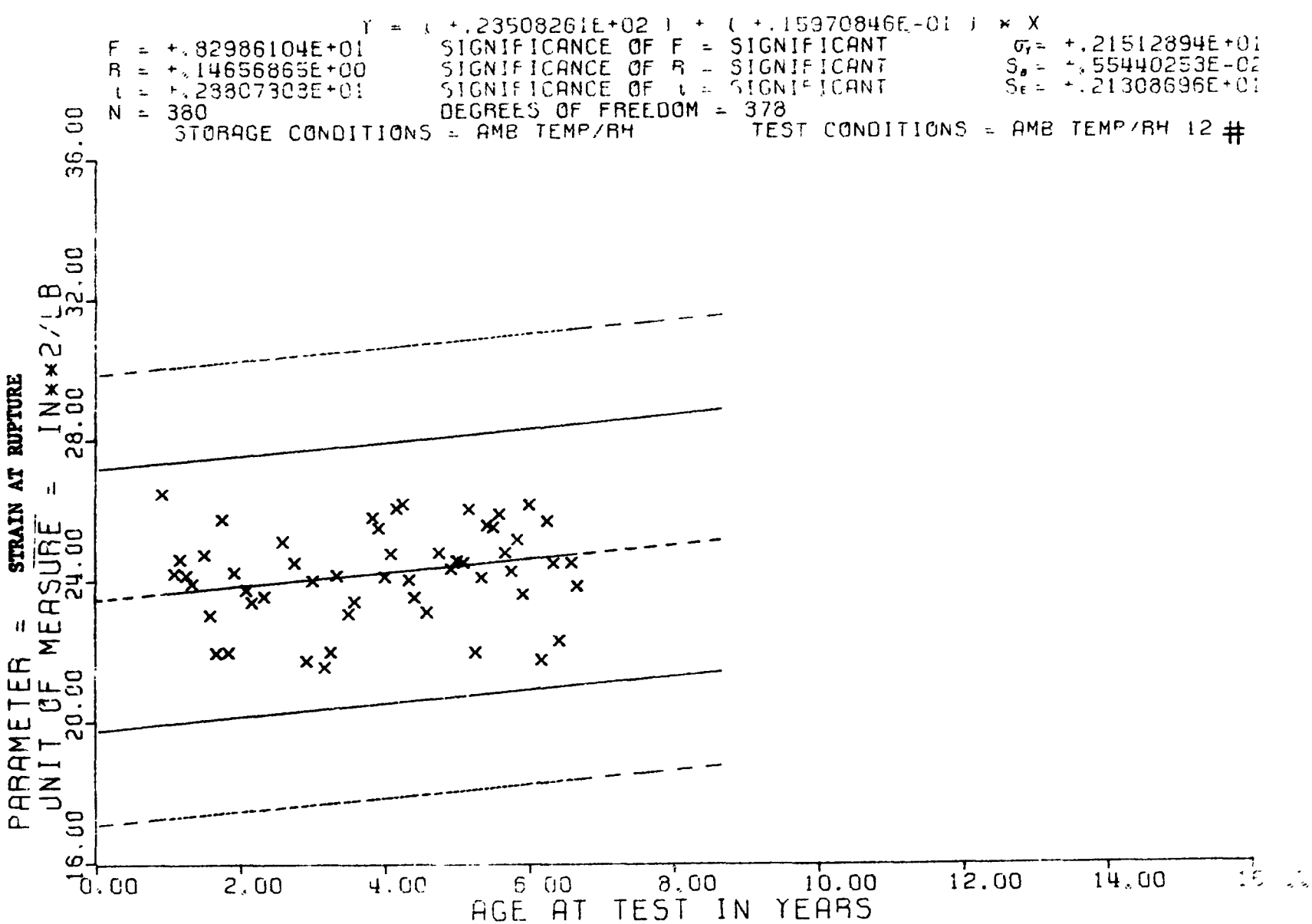
STAGE I, WING 6, TP-H 1011 CREEP COMPLIANCE AT 500 SEC, 12 POUND LOAD

Figure 29

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
11.0	5	38.0	5	62.0	14
13.0	5	39.0	10	63.0	1
14.0	5	40.0	5	64.0	10
15.0	5	42.0	5	65.0	15
16.0	5	43.0	10	66.0	10
18.0	10	46.0	5	67.0	5
19.0	5	47.0	5	68.0	15
20.0	10	48.0	17	69.0	5
21.0	4	49.0	8	70.0	20
22.0	1	50.0	5	71.0	6
23.0	5	51.0	5	72.0	9
25.0	5	52.0	4	74.0	9
26.0	5	53.0	11	75.0	6
28.0	5	55.0	5	76.0	10
31.0	5	57.0	5	77.0	5
33.0	5	59.0	5	79.0	5
35.0	10	60.0	10	80.0	5
36.0	10	61.0	5		380

Stage 1, Wing 6, TP-H 1011, Creep Compliance to Failure, 12 Pound Load



STAGE 1, WING 6, TP-H 1011, CREEP COMPLIANCE TO FAILURE, 12 POUND LOAD

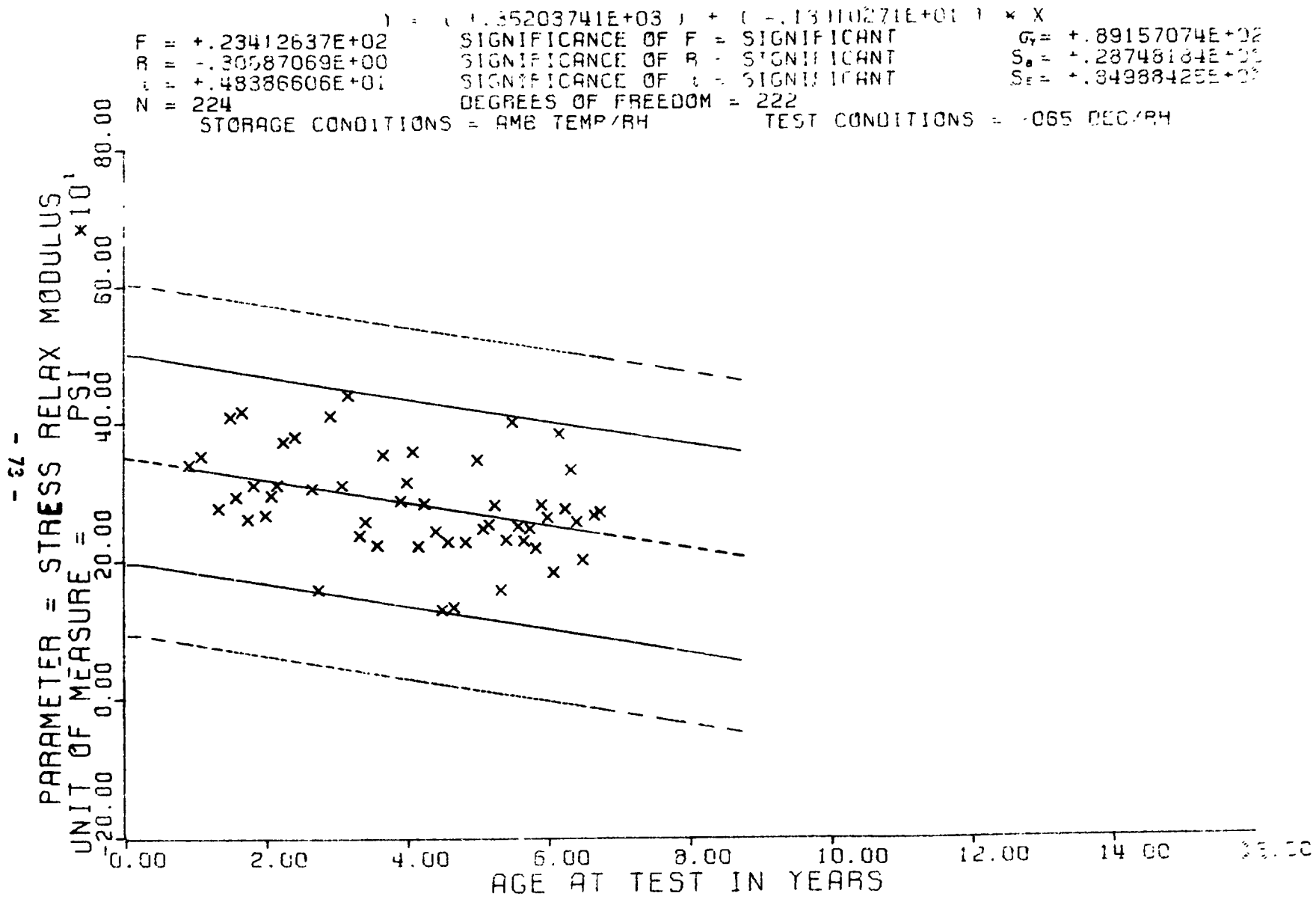
Figure 30

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
11.0	3	40.0	6	64.0	3
13.0	3	41.0	3	65.0	9
16.0	6	43.0	6	66.0	2
18.0	3	44.0	3	67.0	6
19.0	3	47.0	3	68.0	3
20.0	6	48.0	9	69.0	6
21.0	3	49.0	3	70.0	6
22.0	3	50.0	6	71.0	12
24.0	3	51.0	3	72.0	3
25.0	3	53.0	6	73.0	3
26.0	3	54.0	3	74.0	2
27.0	3	55.0	3	75.0	3
29.0	3	56.0	3	76.0	6
32.0	3	58.0	3	77.0	6
33.0	3	60.0	3	78.0	3
35.0	6	61.0	5	80.0	3
37.0	6	62.0	5	81.0	3
38.0	3	63.0	6		224

Stage 1, Wing 6, TP-H 1011 Stress Relaxation Modulus, 0.5% Strain, 10 Sec

-65°



STAGE 1, WING 6, TP-H 1011 STRESS RELAXATION MODULUS, 0.5% STRAIN, 10 SEC

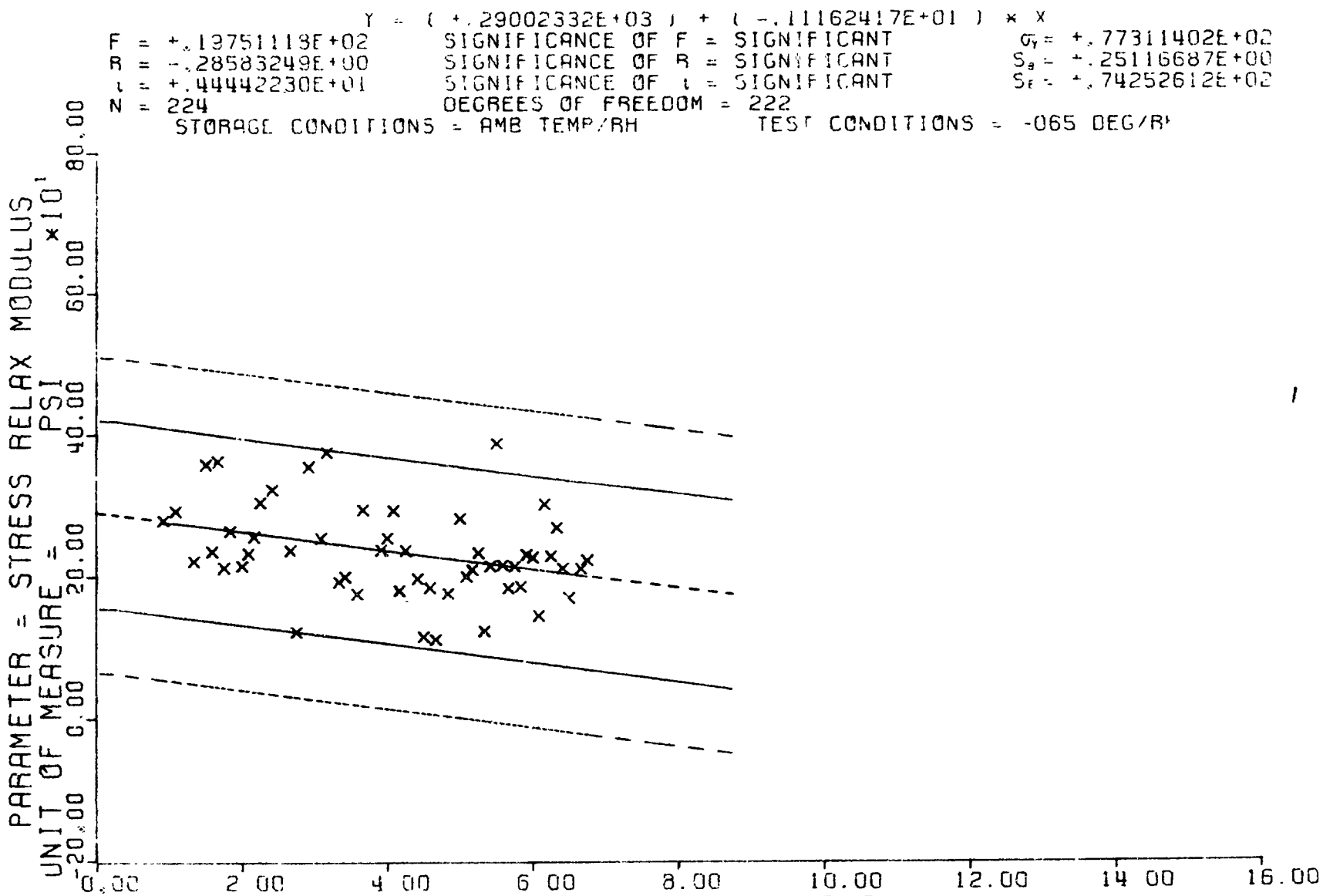
Figure 31

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
11.0	3	40.0	6	64.0	3
13.0	3	41.0	3	65.0	9
16.0	6	43.0	6	66.0	2
18.0	3	44.0	3	67.0	6
19.0	3	47.0	3	68.0	3
20.0	6	48.0	9	69.0	6
21.0	3	49.0	3	70.0	6
22.0	3	50.0	6	71.0	12
24.0	3	51.0	3	72.0	3
25.0	3	53.0	6	73.0	3
26.0	3	54.0	3	74.0	2
27.0	3	55.0	3	75.0	3
29.0	3	56.0	3	76.0	6
32.0	3	58.0	3	77.0	6
33.0	3	60.0	3	78.0	3
35.0	6	61.0	5	80.0	3
37.0	6	62.0	5	81.0	3
38.0	3	63.0	6		224

Stage 1, Wing 6, TP-H 1011 Stress Relaxation Modulus, 0.5% Strain, 50 Sec

-65°



STAGE 1, WING 5, TP-H 1011 STRESS RELAXATION MODULUS, 0.5% STRAIN, 50 SEC

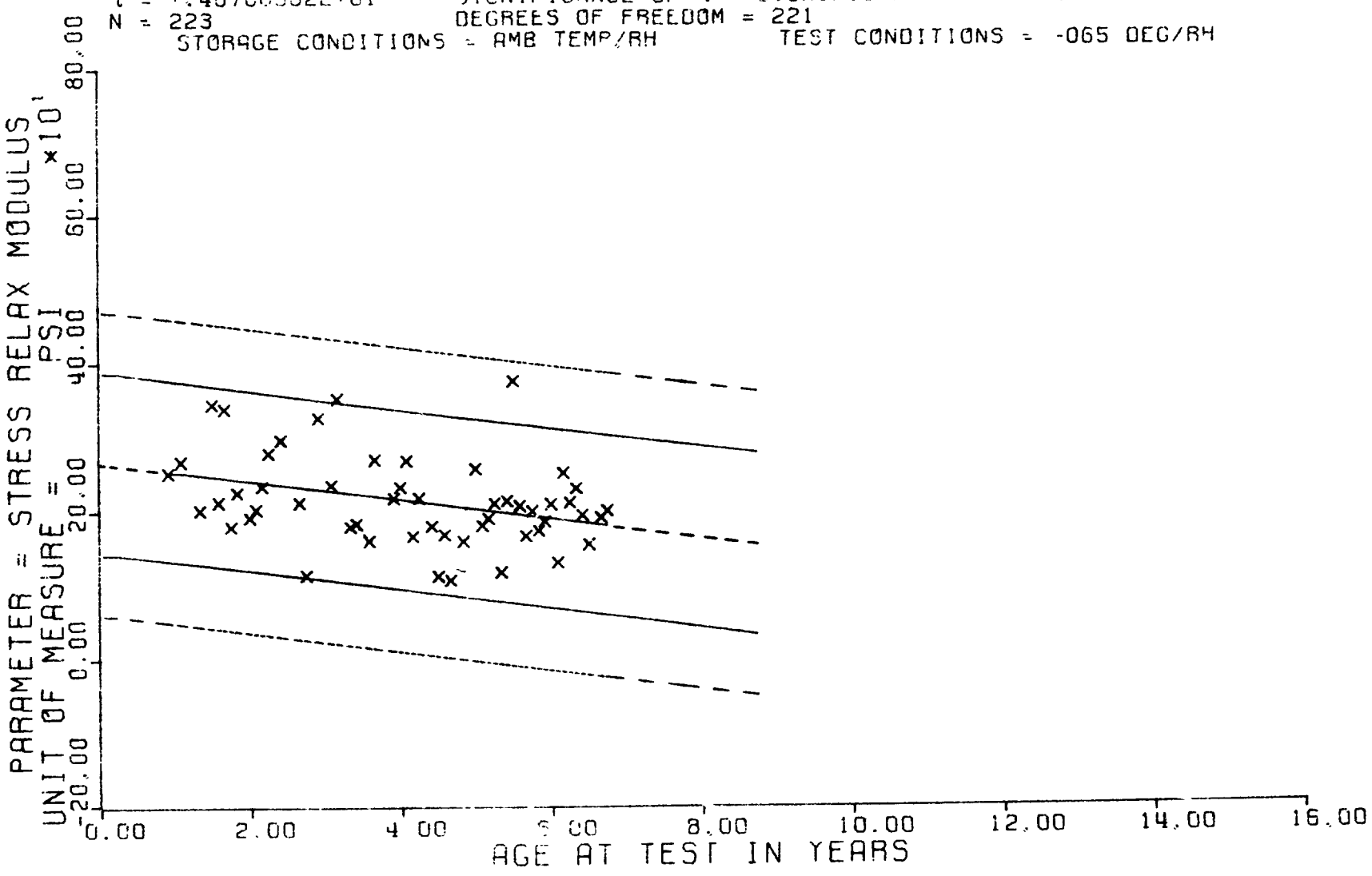
Figure 32

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
11.0	3	40.0	6	64.0	3
13.0	3	41.0	3	65.0	9
16.0	6	43.0	6	66.0	2
18.0	3	44.0	3	67.0	6
19.0	3	47.0	3	68.0	3
20.0	6	48.0	9	69.0	6
21.0	3	49.0	3	70.0	6
22.0	3	50.0	6	71.0	11
24.0	3	51.0	3	72.0	3
25.0	3	53.0	6	73.0	3
26.0	3	54.0	3	74.0	2
27.0	3	55.0	3	75.0	3
29.0	3	56.0	3	76.0	6
32.0	3	58.0	3	77.0	6
33.0	3	60.0	3	78.0	3
35.0	6	61.0	5	80.0	3
37.0	6	62.0	5	81.0	3
38.0	3	63.0	6		223

Stage 1, Wing 6, TP-H 1011 Stress Relaxation Modulus, 0.5% Strain, 100 Sec

-65°



STAGE 1, WING 6, TP-H 1011 STRESS RELAXATION MODULUS, 0.5% STRAIN, 100 SEC

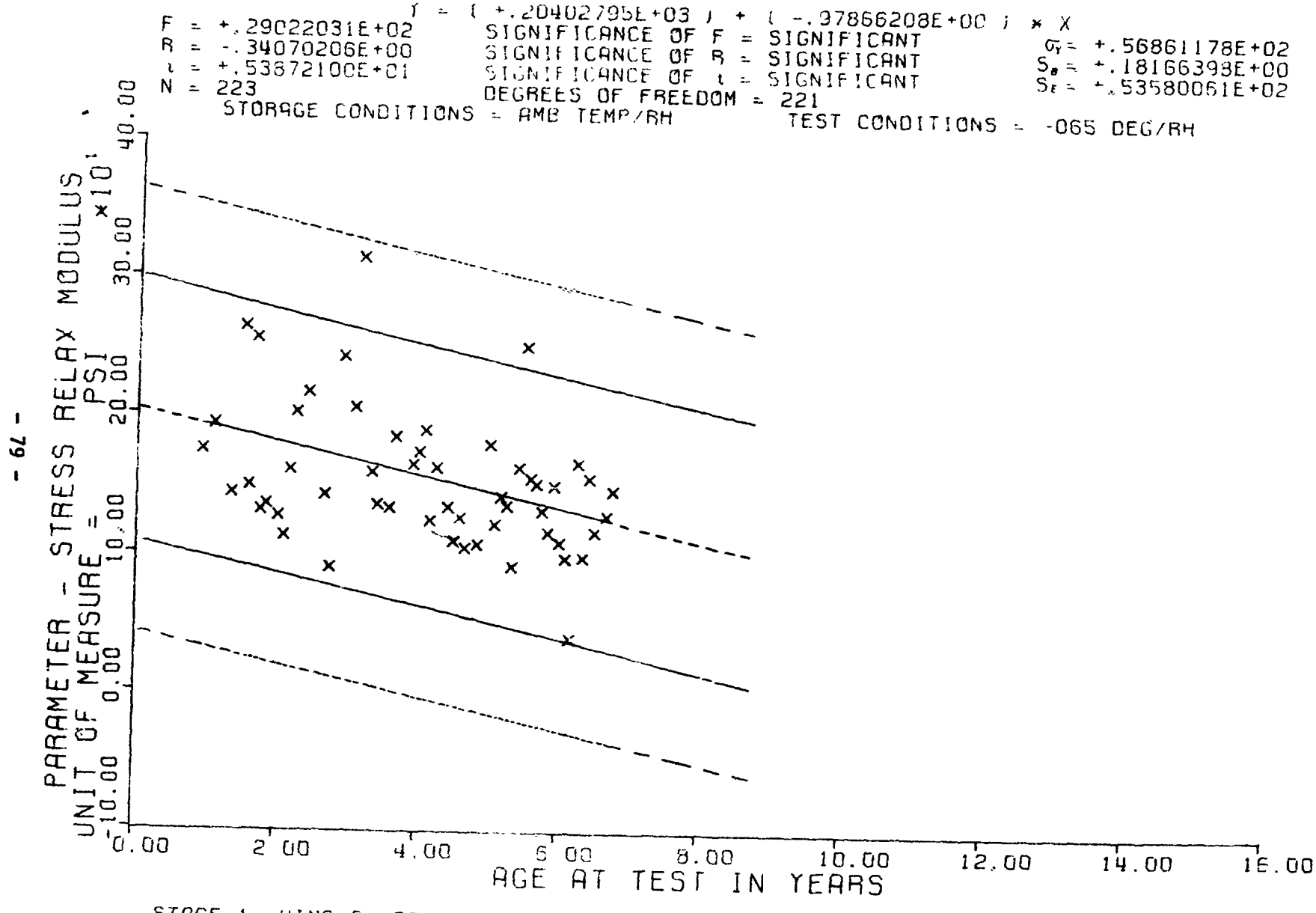
Figure 33

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
11.0	3	40.0	6	64.0	3
13.0	3	41.0	3	65.0	9
16.0	6	43.0	6	66.0	2
18.0	3	44.0	3	67.0	6
19.0	3	47.0	3	68.0	3
20.0	6	48.0	9	69.0	6
21.0	3	49.0	3	70.0	6
22.0	3	50.0	6	71.0	11
24.0	3	51.0	3	72.0	3
25.0	3	53.0	6	73.0	3
26.0	3	54.0	3	74.0	2
27.0	3	55.0	3	75.0	3
29.0	3	56.0	3	76.0	6
32.0	3	58.0	3	77.0	6
33.0	3	60.0	3	78.0	3
35.0	6	61.0	5	80.0	3
37.0	6	62.0	5	81.0	3
38.0	3	63.0	6		223

Stage 1, Wing 6, TP-H 1011 Stress Relaxation Modulus, 0.5% Strain, 100C Sec

-65°



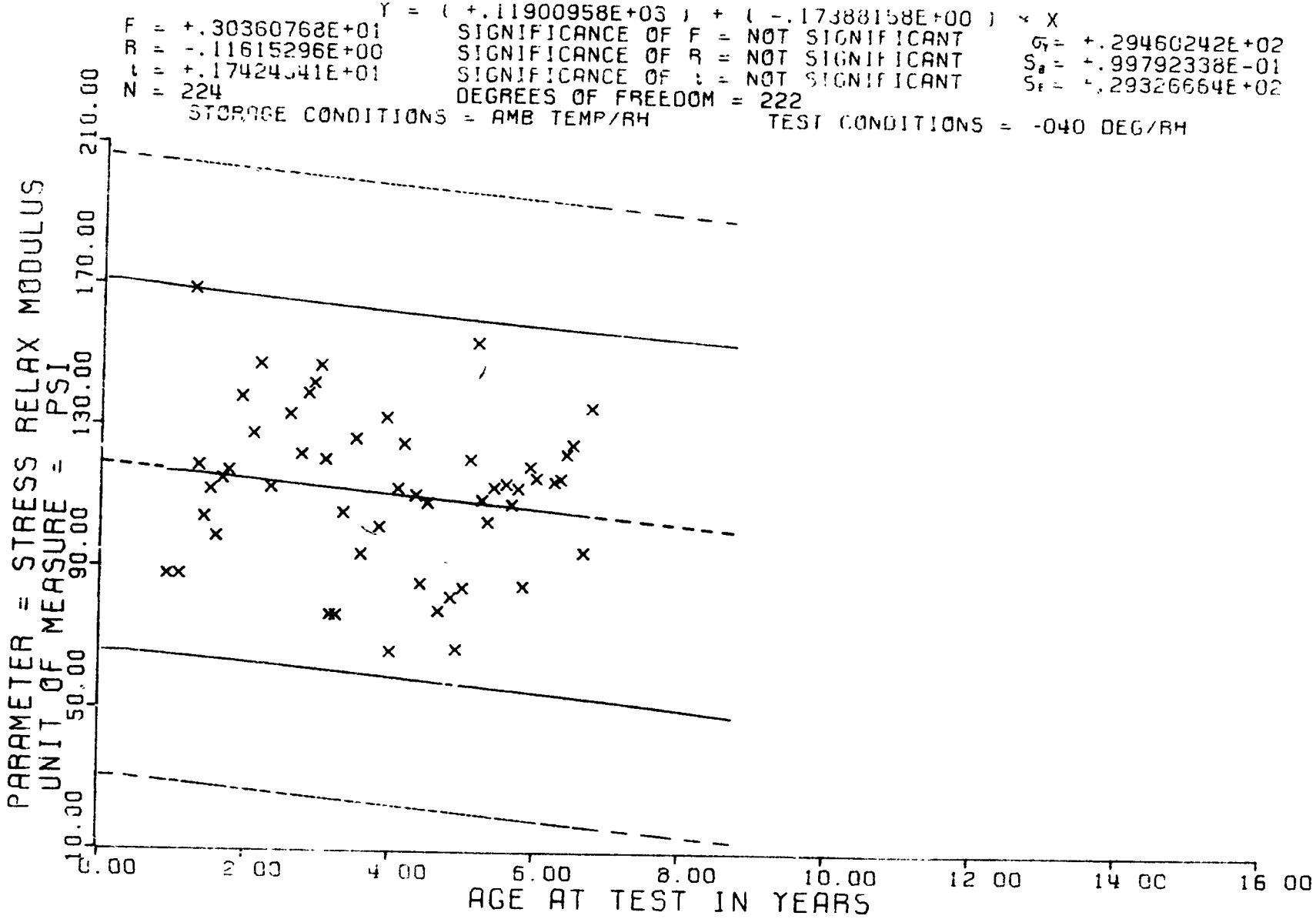
STAGE 1, WING G, TP-H 1011 STRESS RELAXATION MODULUS, 0.5% STRAIN, 1000 SEC

Figure 34

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
11.0	2	37.0	3	61.0	9
13.0	3	38.0	3	62.0	3
15.0	3	39.0	3	63.0	3
16.0	3	40.0	6	64.0	6
17.0	3	42.0	3	65.0	9
18.0	3	43.0	5	67.0	6
19.0	3	46.0	3	68.0	6
20.0	6	47.0	3	69.0	3
21.0	3	48.0	9	70.0	11
23.0	3	49.0	6	71.0	6
25.0	3	50.0	3	72.0	9
26.0	6	52.0	3	75.0	6
28.0	3	53.0	6	76.0	5
31.0	3	54.0	3	77.0	3
33.0	3	56.0	3	78.0	3
34.0	3	58.0	3	80.0	3
35.0	3	59.0	3	81.0	3
36.0	3	60.0	3		224

Stage 1, Wing 6, TP-H 1011 Stress Relaxation Modulus, 0.5% Strain, 10 Sec
-040°



STAGE 1, WING 6, TP-H 1011 STRESS RELAXATION MODULUS, 0.5% STRAIN, 10 SEC

Figure 35

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
11.0	2	37.0	3	61.0	9
13.0	3	38.0	3	62.0	3
15.0	3	39.0	3	63.0	3
16.0	3	40.0	6	64.0	6
17.0	3	42.0	3	65.0	9
18.0	3	43.0	5	67.0	6
19.0	3	46.0	3	68.0	6
20.0	6	47.0	3	69.0	3
21.0	3	48.0	9	70.0	11
23.0	3	49.0	6	71.0	6
25.0	3	50.0	3	72.0	9
26.0	6	52.0	3	75.0	6
28.0	3	53.0	6	76.0	5
31.0	3	54.0	3	77.0	3
33.0	3	56.0	3	78.0	3
34.0	3	58.0	3	80.0	3
35.0	3	59.0	3	81.0	3
36.0	3	60.0	3		224

Stage 1, Wing 6, TP-H 1011 Stress Relaxation Modulus, 0.5% Strain, 50 Sec
-040°

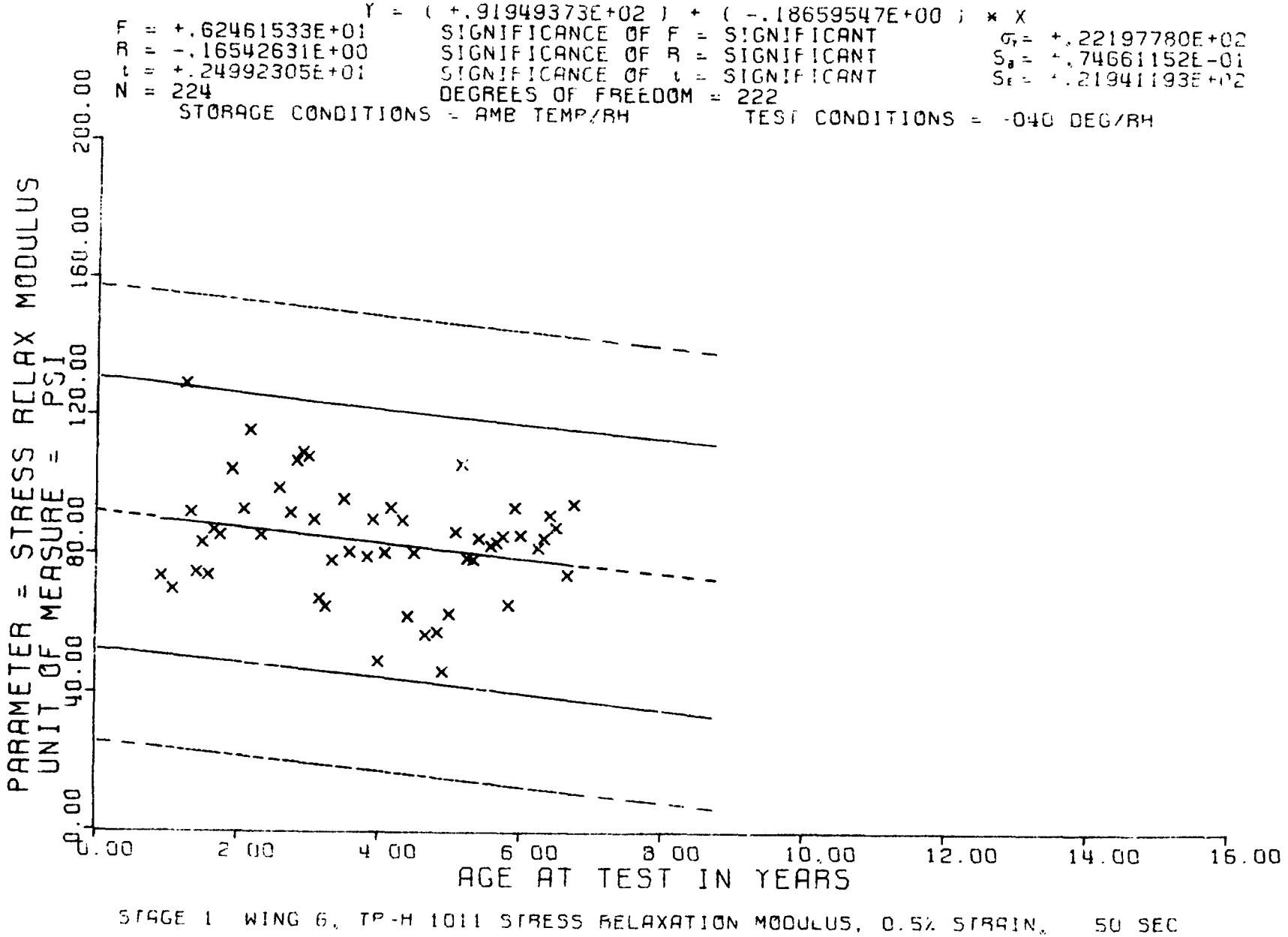
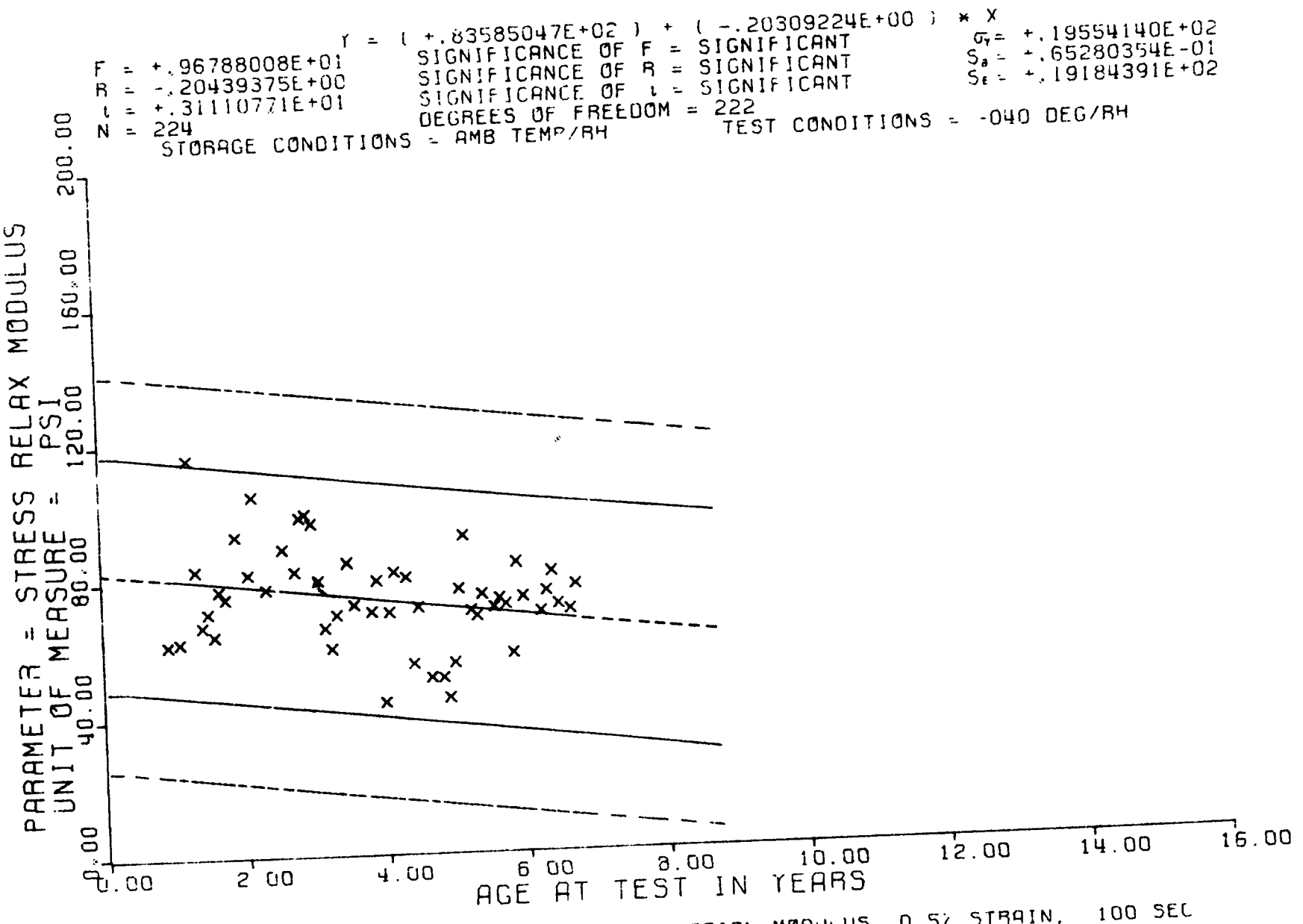


Figure 36

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
11.0	2	37.0	3	61.0	9
13.0	3	38.0	3	62.0	3
15.0	3	39.0	3	63.0	3
16.0	3	40.0	6	64.0	6
17.0	3	42.0	3	65.0	9
18.0	3	43.0	5	67.0	6
19.0	3	46.0	3	68.0	6
20.0	6	47.0	3	69.0	3
21.0	3	48.0	9	70.0	11
23.0	3	49.0	6	71.0	6
25.0	3	50.0	3	72.0	9
26.0	6	52.0	3	75.0	6
28.0	3	53.0	6	76.0	5
31.0	3	54.0	3	77.0	3
33.0	3	56.0	3	78.0	3
34.0	3	58.0	3	80.0	3
35.0	3	59.0	3	81.0	3
36.0	3	60.0	3		224

Stage 1, Wing 6, TP-H 1011 Stress Relaxation Modulus, 0.5% Strain, 100 Sec
-040°



STAGE 1, WING 6, TP-H 1011 STRESS RELAXATION MODULUS, 0.5% STRAIN, 100 SEC

Figure 37

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
11.0	2	37.0	3	61.0	9
13.0	3	38.0	3	62.0	3
15.0	3	39.0	3	63.0	3
16.0	3	40.0	6	64.0	6
17.0	3	42.0	3	65.0	9
18.0	3	43.0	5	67.0	6
19.0	3	46.0	3	68.0	6
20.0	6	47.0	3	69.0	3
21.0	3	48.0	9	70.0	11
23.0	3	49.0	6	71.0	6
25.0	3	50.0	3	72.0	9
26.0	6	52.0	3	75.0	6
28.0	3	53.0	6	76.0	5
31.0	3	54.0	3	77.0	3
33.0	3	56.0	3	78.0	3
34.0	3	58.0	3	80.0	3
35.0	3	59.0	3	81.0	3
36.0	3	60.0	3		224

Stage 1, Wing 6, TP-H 1011 Stress Relaxation Modulus, 0.5% Strain, 1000 Sec

-040°

Y = (+.62368852E+02) + (-.19260839E+00) * X

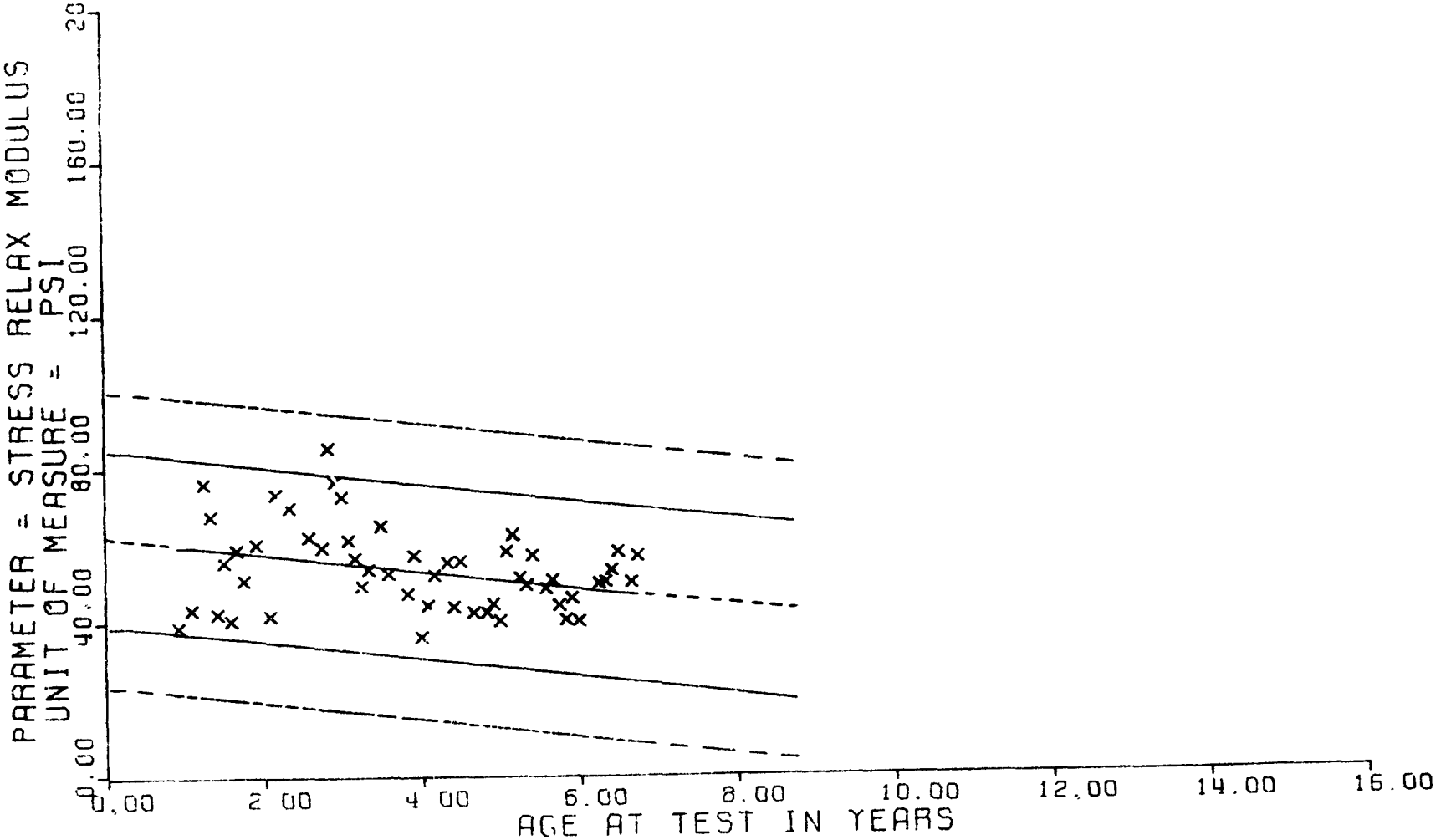
F = +.19385842E+02 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +.13375288E+02

R = -.28339125E+00 SIGNIFICANCE OF R = SIGNIFICANT S_a = +.43745582E-01

t = +.44029357E+01 SIGNIFICANCE OF t = SIGNIFICANT S_E = +.12855816E+02

N = 224 DEGREES OF FREEDOM = 222

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = -040 DEG/RH



STAGE 1, WING 6, TP-H 1011 STRESS RELAXATION MODULUS, 0.5% STRAIN, 1000 SEC

4

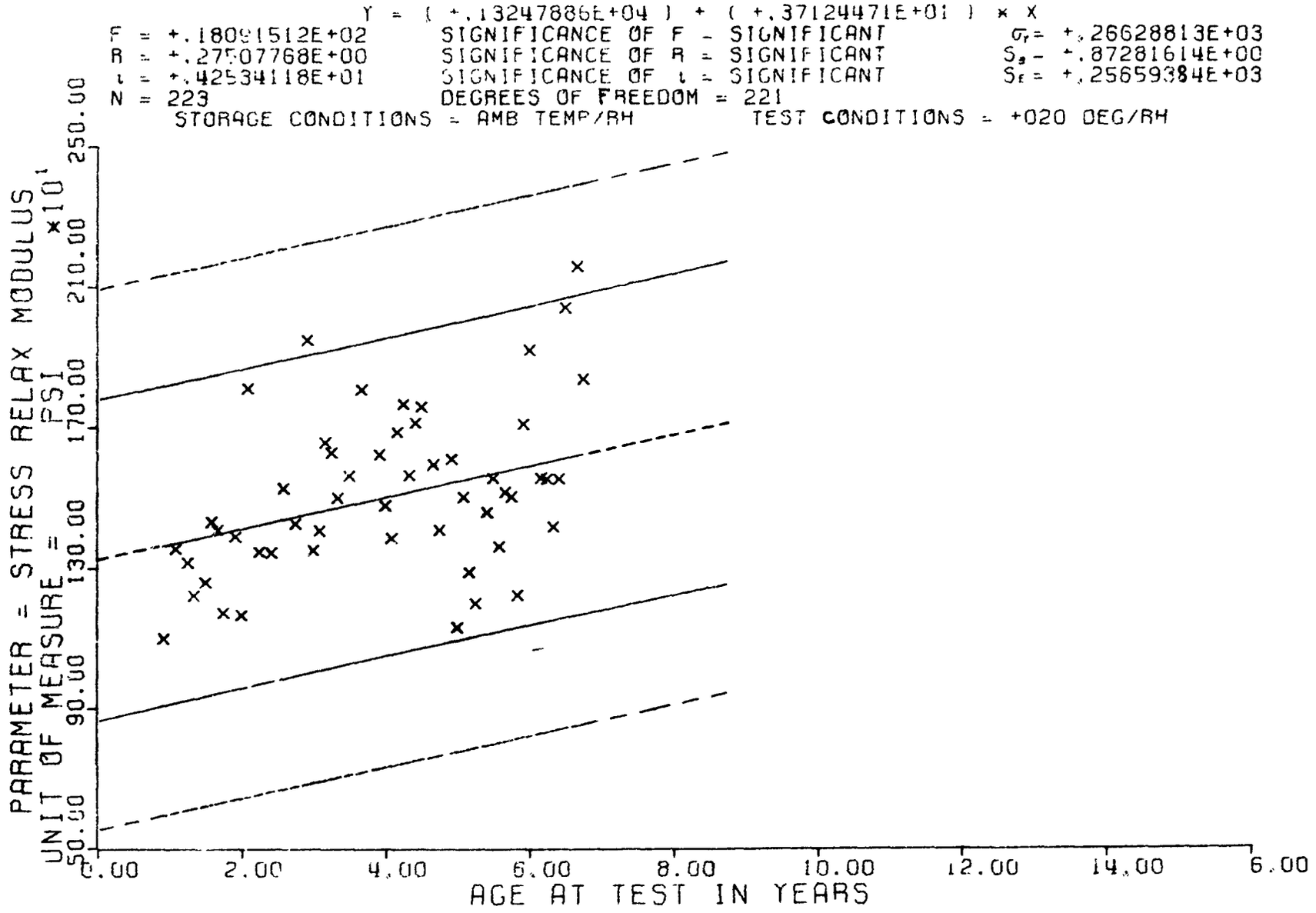
Figure 38

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
11.0	3	38.0	3	62.0	3
13.0	3	39.0	6	63.0	9
15.0	3	40.0	2	65.0	9
16.0	3	42.0	6	66.0	6
18.0	6	44.0	3	67.0	7
19.0	3	47.0	6	68.0	3
20.0	6	48.0	6	69.0	6
21.0	3	49.0	6	70.0	6
23.0	3	50.0	3	71.0	7
24.0	3	51.0	3	72.0	6
25.0	3	52.0	3	74.0	3
27.0	3	53.0	3	75.0	5
29.0	3	54.0	6	76.0	5
31.0	3	56.0	3	77.0	2
33.0	3	57.0	3	78.0	3
35.0	6	59.0	3	80.0	3
36.0	3	60.0	3	81.0	3
37.0	3	61.0	6		223

Stage 1 Wing 6, TP-H 1011 Stress Relaxation Modulus, 3 Percent Strain, 10 Sec

+020°



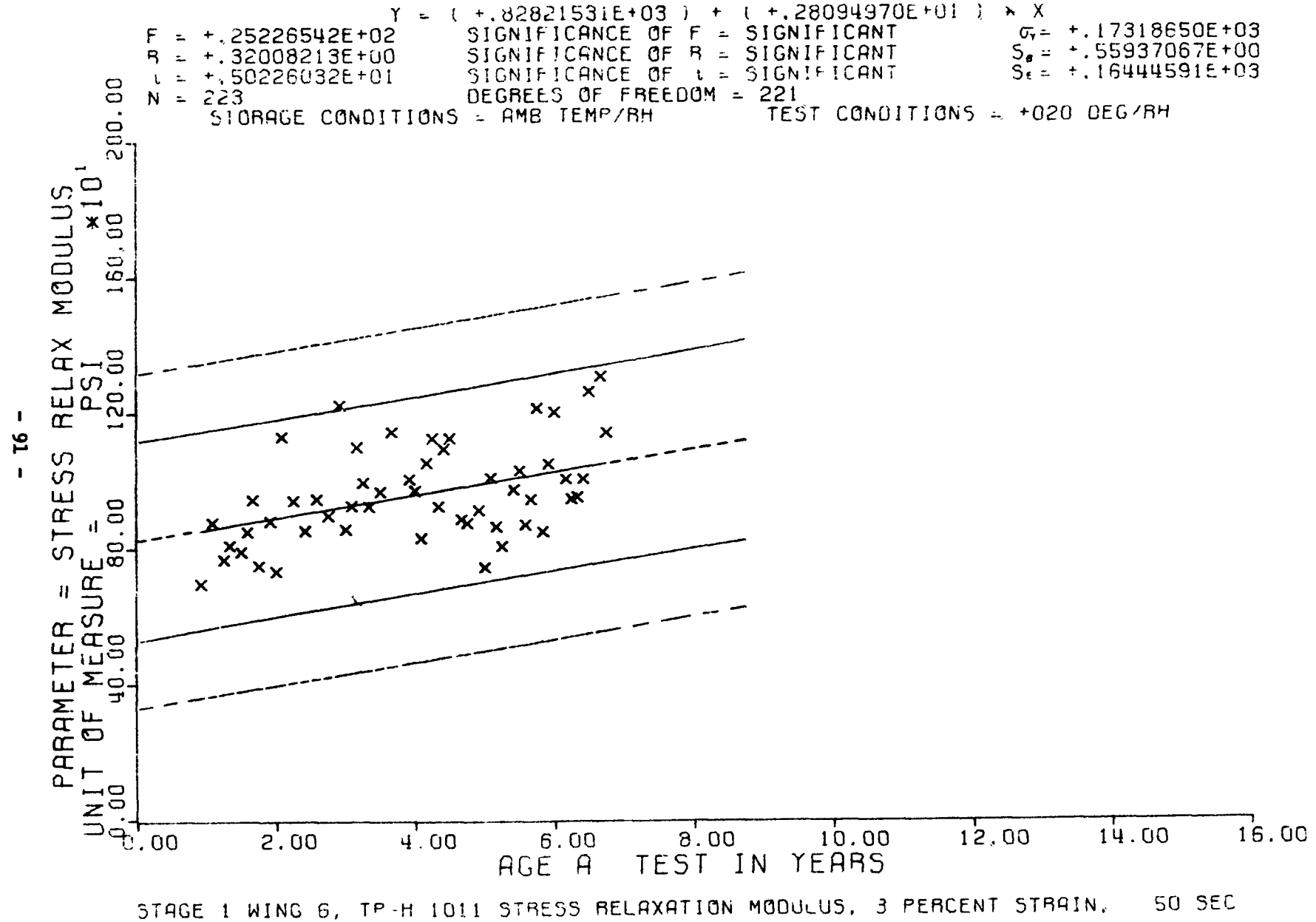
STAGE I WING G, TP-H 1011 STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 10 SEC

Figure 39

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
11.0	3	38.0	3	62.0	3
13.0	3	39.0	6	63.0	9
15.0	3	40.0	2	65.0	9
16.0	3	42.0	6	66.0	6
18.0	6	44.0	3	67.0	7
19.0	3	47.0	6	68.0	3
20.0	6	48.0	6	69.0	6
21.0	3	49.0	6	70.0	6
23.0	3	50.0	3	71.0	7
24.0	3	51.0	3	72.0	6
25.0	3	52.0	3	74.0	3
27.0	3	53.0	3	75.0	5
29.0	3	54.0	6	76.0	5
31.0	3	56.0	3	77.0	2
33.0	3	57.0	3	78.0	3
35.0	6	59.0	3	80.0	3
36.0	3	60.0	3	81.0	3
37.0	3	61.0	6		223

Stage 1 Wing 6, TP-H 1011 Stress Relaxation Modulus, 3 Percent Strain, 50 Sec
+020°



STAGE 1 WING 6, TP-H 1011 STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 50 SEC

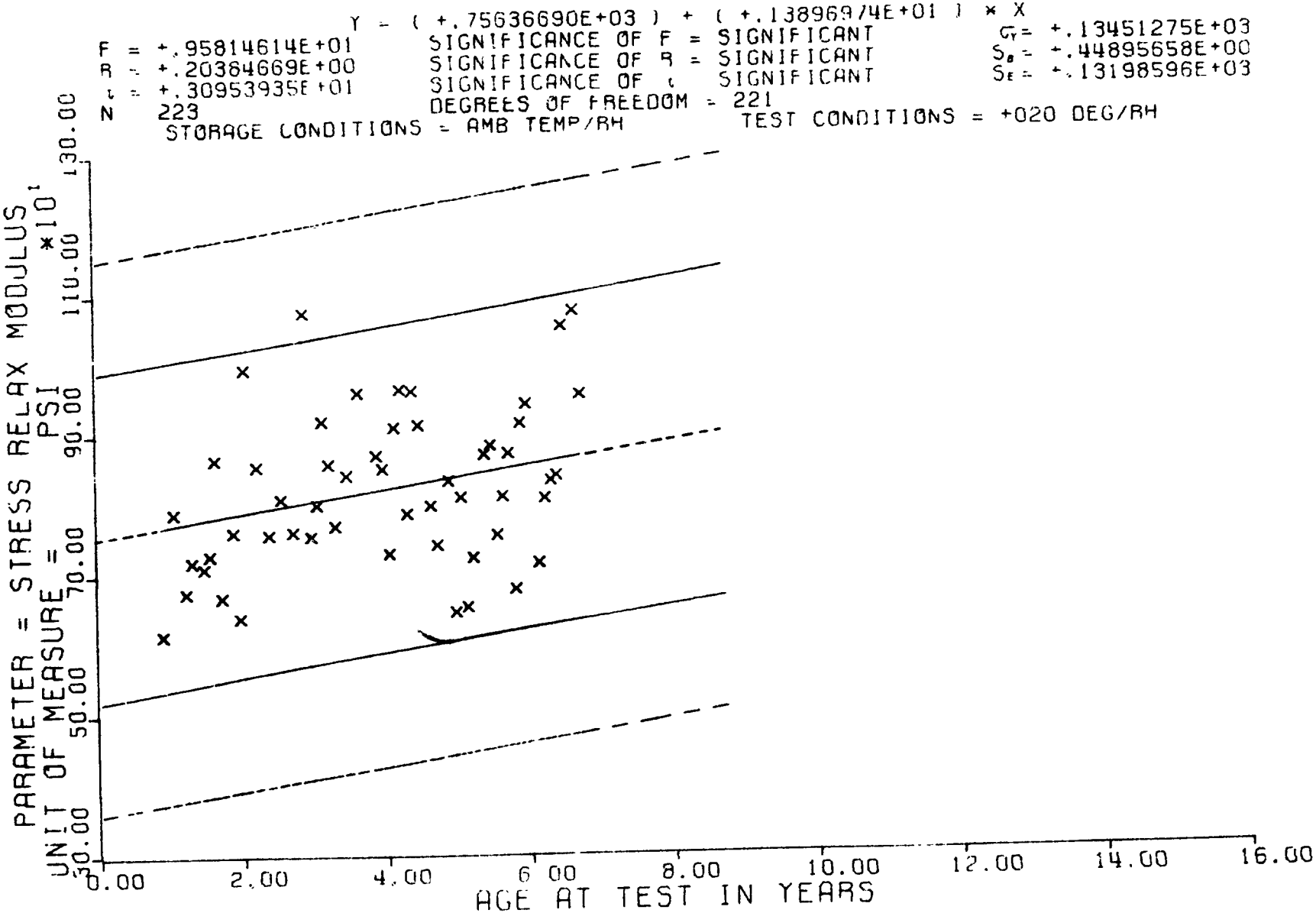
Figure 40

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
11.0	3	38.0	3	62.0	3
13.0	3	39.0	6	63.0	9
15.0	3	40.0	2	65.0	9
16.0	3	42.0	6	66.0	6
18.0	6	44.0	3	67.0	7
19.0	3	47.0	6	68.0	3
20.0	6	48.0	6	69.0	6
21.0	3	49.0	6	70.0	6
23.0	3	50.0	3	71.0	7
24.0	3	51.0	3	72.0	6
25.0	3	52.0	3	74.0	3
27.0	3	53.0	3	75.0	5
29.0	3	54.0	6	76.0	5
31.0	3	56.0	3	77.0	2
33.0	3	57.0	3	78.0	3
35.0	6	59.0	3	80.0	3
36.0	3	60.0	3	81.0	3
37.0	3	61.0	6		223

Stage 1 Wing 6, TP-H 1011 Stress Relaxation Modulus, 3 Percent Strain, 100 Sec

+020°



STAGE 1 WING 6, TP-H 1011 STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 100 SEC

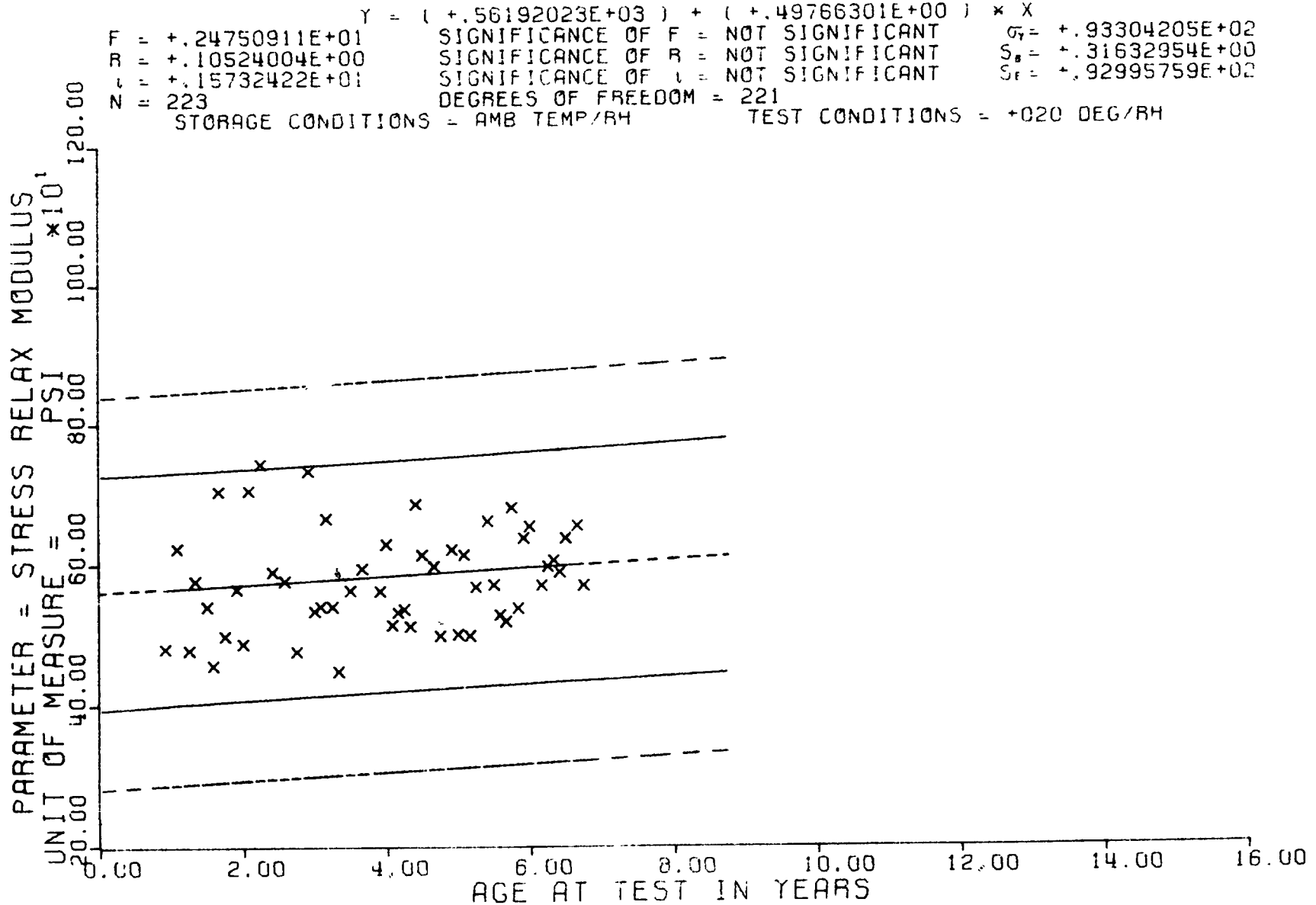
Figure 41

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
11.0	3	38.0	3	62.0	3
13.0	3	39.0	6	63.0	9
15.0	3	40.0	2	65.0	9
16.0	3	42.0	6	66.0	6
18.0	6	44.0	3	67.0	7
19.0	3	47.0	6	68.0	3
20.0	6	48.0	6	69.0	6
21.0	3	49.0	6	70.0	6
23.0	3	50.0	3	71.0	7
24.0	3	51.0	3	72.0	6
25.0	3	52.0	3	74.0	3
27.0	3	53.0	3	75.0	5
29.0	3	54.0	6	76.0	5
31.0	3	56.0	3	77.0	2
33.0	3	57.0	3	78.0	3
35.0	6	59.0	3	80.0	3
36.0	3	60.0	3	81.0	3
37.0	3	61.0	6		223

Stage 1 Wing 6, TP-H 1011 Stress Relaxation Modulus, 3 Per Cent Strain, 1000 Sec

+020°



STAGE 1 WING 6, TP-H 1011 STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 1000 SEC

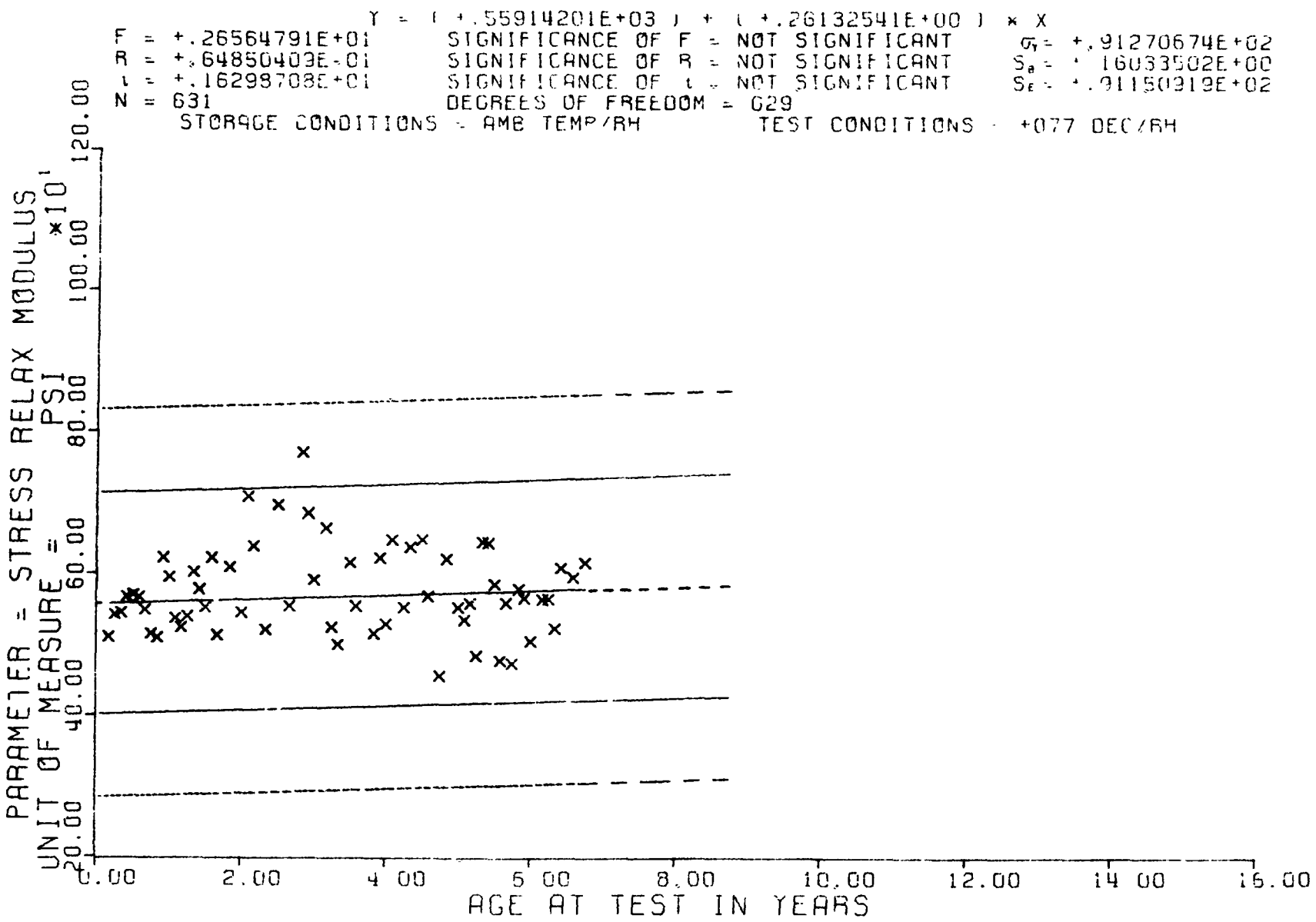
Figure 42

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
2.0	3	20.0	4	48.0	9	70.0	12
3.0	6	22.0	3	49.0	3	71.0	3
4.0	18	24.0	3	51.0	3	72.0	6
5.0	22	25.0	3	52.0	6	74.0	3
6.0	21	26.0	3	54.0	3	75.0	6
7.0	35	28.0	3	55.0	3	76.0	3
8.0	27	30.0	3	57.0	3	77.0	6
9.0	36	32.0	3	58.0	3	79.0	3
10.0	35	34.0	3	60.0	12	81.0	3
11.0	37	35.0	3	61.0	3		631
12.0	44	36.0	6	62.0	3		
13.0	27	38.0	3	63.0	3		
14.0	34	39.0	6	64.0	9		
15.0	39	40.0	3	65.0	3		
16.0	18	42.0	6	66.0	6		
17.0	16	43.0	3	67.0	3		
18.0	1	46.0	3	68.0	6		
19.0	10	47.0	9	69.0	6		

Stage 1 Wing 6, TP-H 1011 Stress Relaxation Modulus, 3 Percent Strain, 10 Sec.

+077°



STAGE 1 WINC 6, TP-H 1011 STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 10 SEC

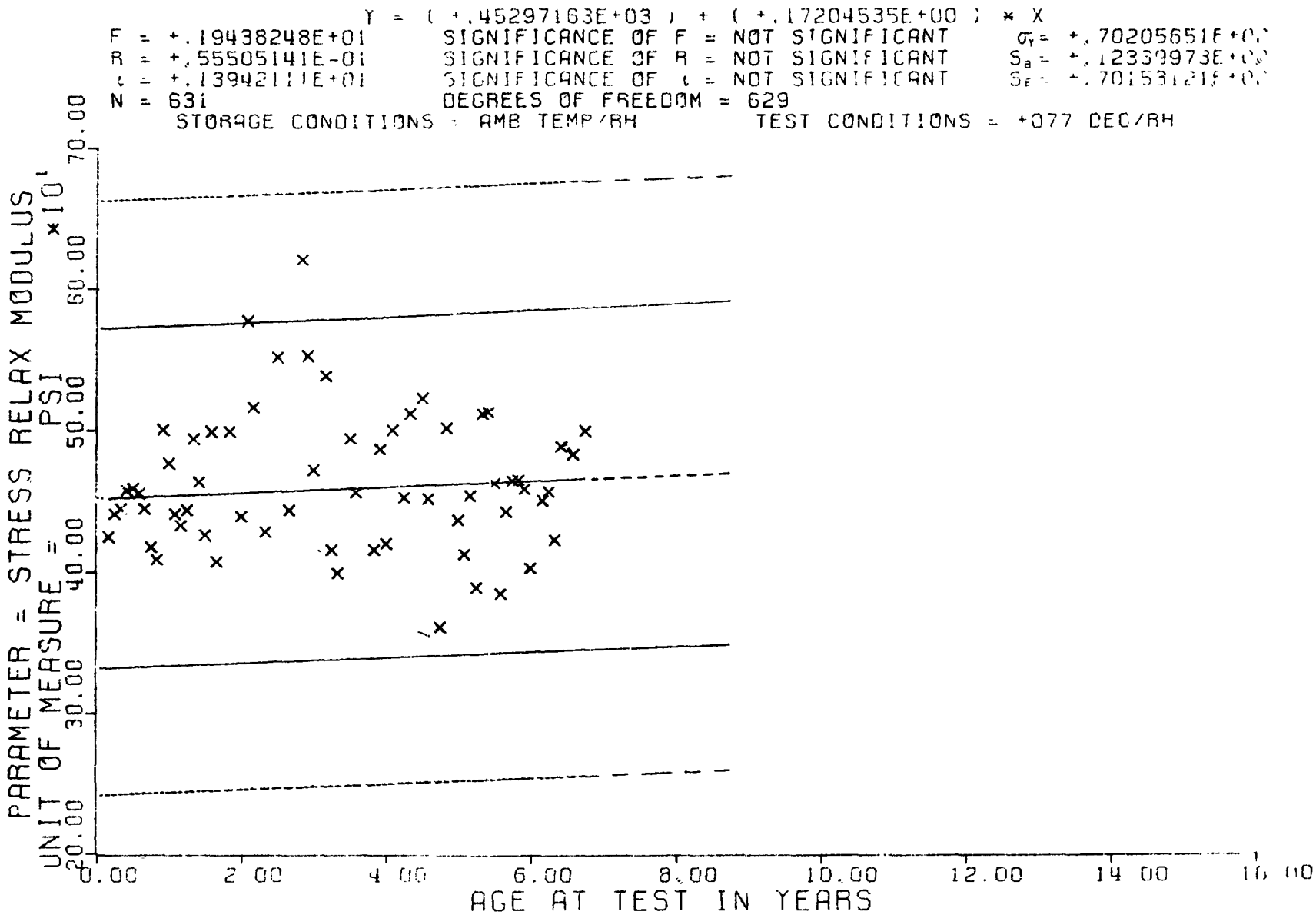
Figure 43

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
2.0	3	20.0	4	48.0	9	70.0	12
3.0	6	22.0	3	49.0	3	71.0	3
4.0	18	24.0	3	51.0	3	72.0	6
5.0	22	25.0	3	52.0	6	74.0	3
6.0	21	26.0	3	54.0	3	75.0	6
7.0	35	28.0	3	55.0	3	76.0	3
8.0	27	30.0	3	57.0	3	77.0	6
9.0	36	32.0	3	58.0	3	79.0	3
10.0	35	34.0	3	60.0	12	81.0	3
11.0	37	35.0	3	61.0	3		331
12.0	44	36.0	6	62.0	3		
13.0	27	38.0	3	63.0	3		
14.0	34	39.0	6	64.0	9		
15.0	39	40.0	3	65.0	3		
16.0	18	42.0	6	66.0	6		
17.0	16	43.0	3	67.0	3		
18.0	1	46.0	3	68.0	6		
19.0	10	47.0	9	69.0	6		

Stage 1 Wing 6, TP-H 1011 Stress Relaxation Modulus, 3 Percent Strain, 50 Sec

+077°



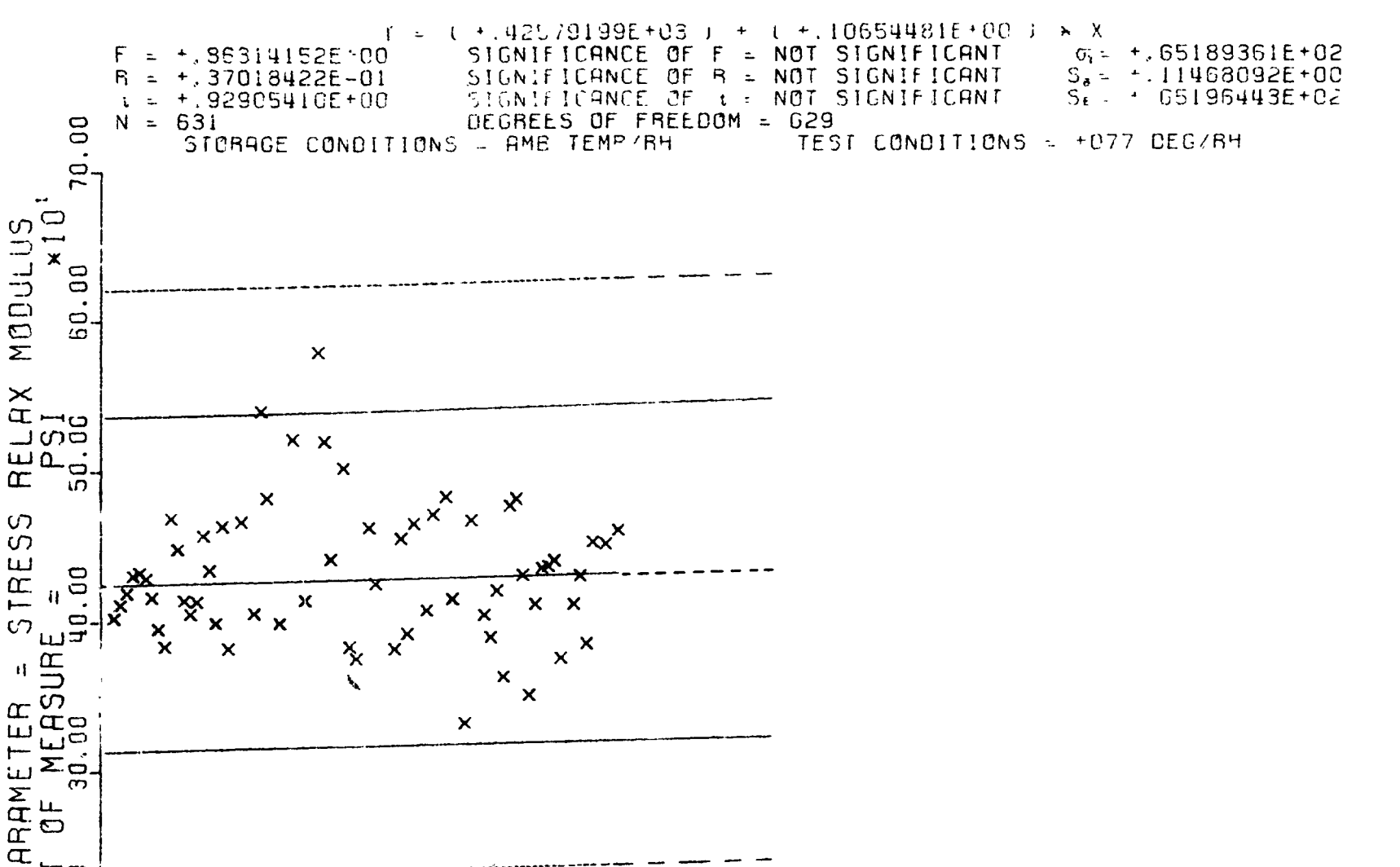
STAGE 1 WING 6, TP-H 1011 STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 50 SFI

Figure 44

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
2.0	3	20.0	4	48.0	9	70.0	12
3.0	6	22.0	3	49.0	3	71.0	3
4.0	18	24.0	3	51.0	3	72.0	6
5.0	22	25.0	3	52.0	6	74.0	3
6.0	21	26.0	3	54.0	3	75.0	6
7.0	35	28.0	3	55.0	3	76.0	3
8.0	27	30.0	3	57.0	3	77.0	6
9.0	36	32.0	3	58.0	3	79.0	3
10.0	35	34.0	3	60.0	12	81.0	3
11.0	37	35.0	3	61.0	3		631
12.0	44	36.0	6	62.0	3		
13.0	27	38.0	3	63.0	3		
14.0	34	39.0	6	64.0	9		
15.0	39	40.0	3	65.0	3		
16.0	18	42.0	6	66.0	6		
17.0	16	43.0	3	67.0	3		
18.0	1	46.0	3	68.0	6		
19.0	10	47.0	9	69.0	6		

Stage 1 Wing 6, TP-H 1011 Stress Relaxation Modulus, 3 Percent Strain, 100 Sec
+077°



STAGE I WING G TP-H 1011 STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 100 SEC

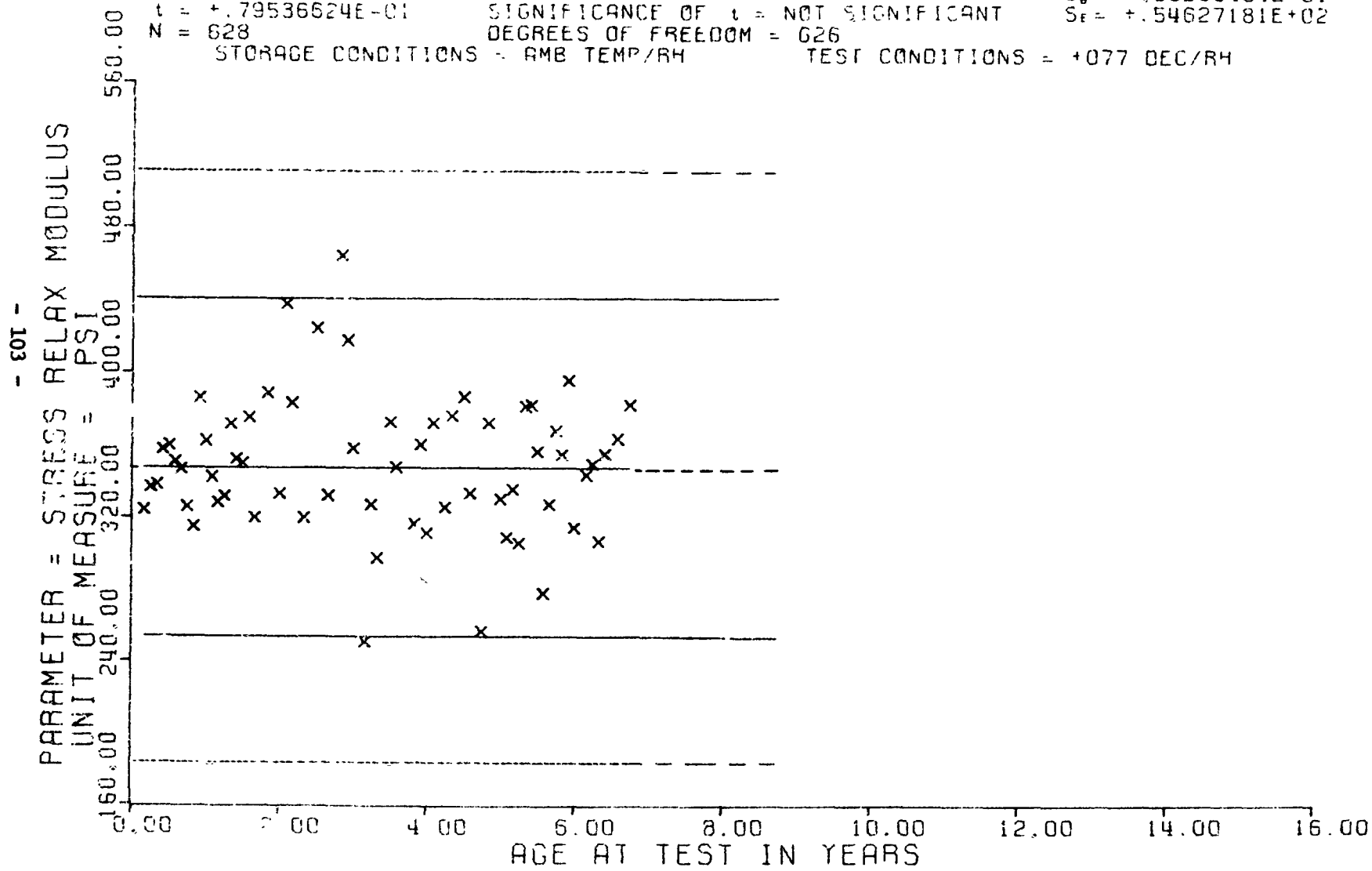
Figure 45

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
2.0	3	20.0	4	48.0	9	70.0	12
3.0	6	22.0	3	49.0	3	71.0	3
4.0	18	24.0	3	51.0	3	72.0	6
5.0	19	25.0	3	52.0	6	74.0	3
6.0	21	26.0	3	54.0	3	75.0	6
7.0	35	28.0	3	55.0	3	76.0	3
8.0	27	30.0	3	57.0	3	77.0	6
9.0	36	32.0	3	58.0	3	79.0	3
10.0	35	34.0	3	60.0	12	81.0	3
11.0	37	35.0	3	61.0	3		628
12.0	44	36.0	6	62.0	3		
13.0	27	38.0	3	63.0	3		
14.0	34	39.0	6	64.0	9		
15.0	39	40.0	3	65.0	3		
16.0	18	42.0	6	66.0	6		
17.0	16	43.0	3	67.0	3		
18.0	1	46.0	3	68.0	6		
19.0	10	47.0	9	69.0	6		

Stage 1 Wing 6, TP-H 1011 Stress Relaxation Modulus, 3 Percent Strain, 1000 Sec

+077°



STAGE I WINC 0, TP-H 1011 STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 1000 SEC

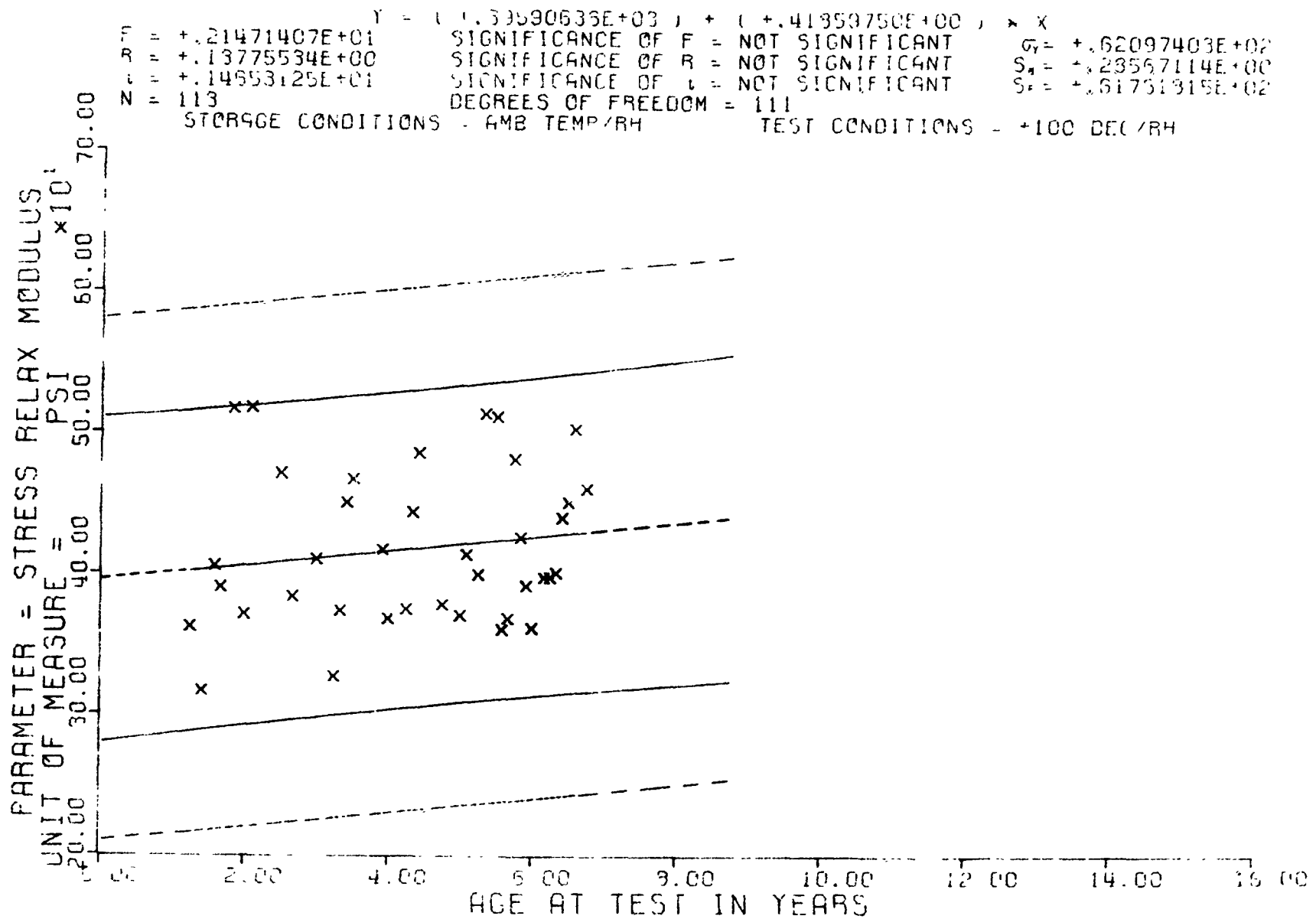
Figure 46

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
15.0	3	39.0	3	60.0	3	72.0	3
17.0	3	40.0	3	61.0	3	74.0	3
19.0	3	41.0	3	63.0	3	75.0	3
20.0	3	42.0	3	64.0	3	76.0	2
22.0	3	47.0	3	66.0	3	77.0	3
24.0	3	48.0	3	67.0	3	78.0	3
25.0	3	51.0	3	68.0	3	79.0	3
30.0	3	52.0	3	69.0	3	81.0	3
32.0	3	53.0	3	70.0	3		113
36.0	3	57.0	3	71.0	3		

Stage 1 Wing 6, TP-H 1011 Stress Relaxation Modulus, 3 Percent Strain, 10 Sec

+100°



STAGE 1 WING 6 TP-H 1011 STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 10 DEC

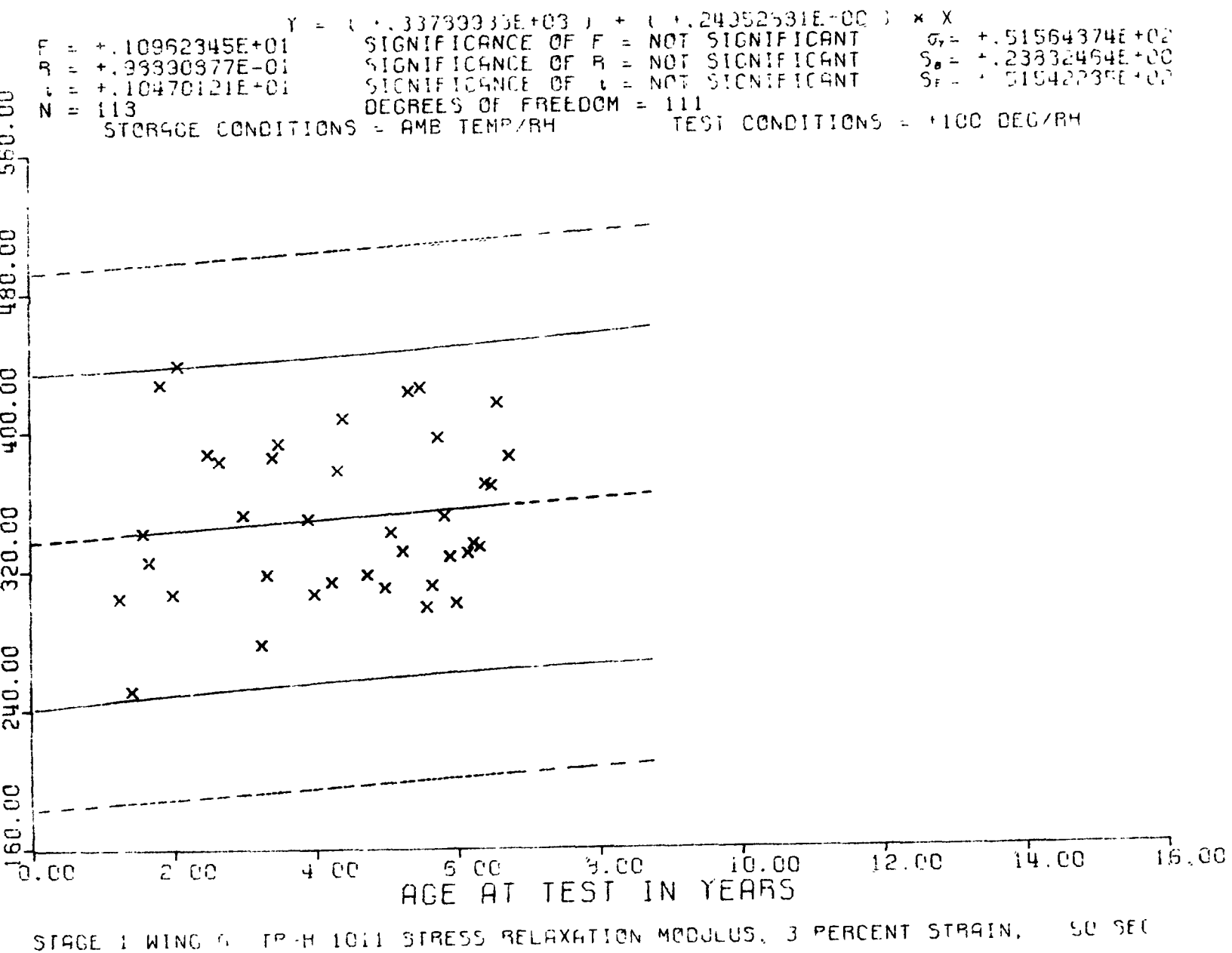
Figure 47

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
15.0	3	39.0	3	60.0	3	72.0	3
17.0	3	40.0	3	61.0	3	74.0	3
19.0	3	41.0	3	63.0	3	75.0	3
20.0	3	42.0	3	64.0	3	76.0	2
22.0	3	47.0	3	66.0	3	77.0	3
24.0	3	48.0	3	67.0	3	78.0	3
25.0	3	51.0	3	68.0	3	79.0	3
30.0	3	52.0	3	69.0	3	81.0	3
32.0	3	53.0	3	70.0	3		113
36.0	3	57.0	3	71.0	3		

Stage 1 Wing 6, TP-H 1011 Stress Relaxation Modulus, 3 Percent Strain, 50 Sec

+100°



STAGE 1 WING G TP-H 1011 STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 60 SEC

Figure 48

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
15.0	3	39.0	3	60.0	3	72.0	3
17.0	3	40.0	3	61.0	3	74.0	3
19.0	3	41.0	3	63.0	3	75.0	3
20.0	3	42.0	3	64.0	3	76.0	2
22.0	3	47.0	3	66.0	3	77.0	3
24.0	3	48.0	3	67.0	3	78.0	3
25.0	3	51.0	3	68.0	3	79.0	3
30.0	3	52.0	3	69.0	3	81.0	3
32.0	3	53.0	3	70.0	3		113
36.0	3	57.0	3	71.0	3		

Stage 1 Wing 6, TP-H 1011 Stress Relaxation Modulus, 3 Percent Strain, 100 Sec

+100°

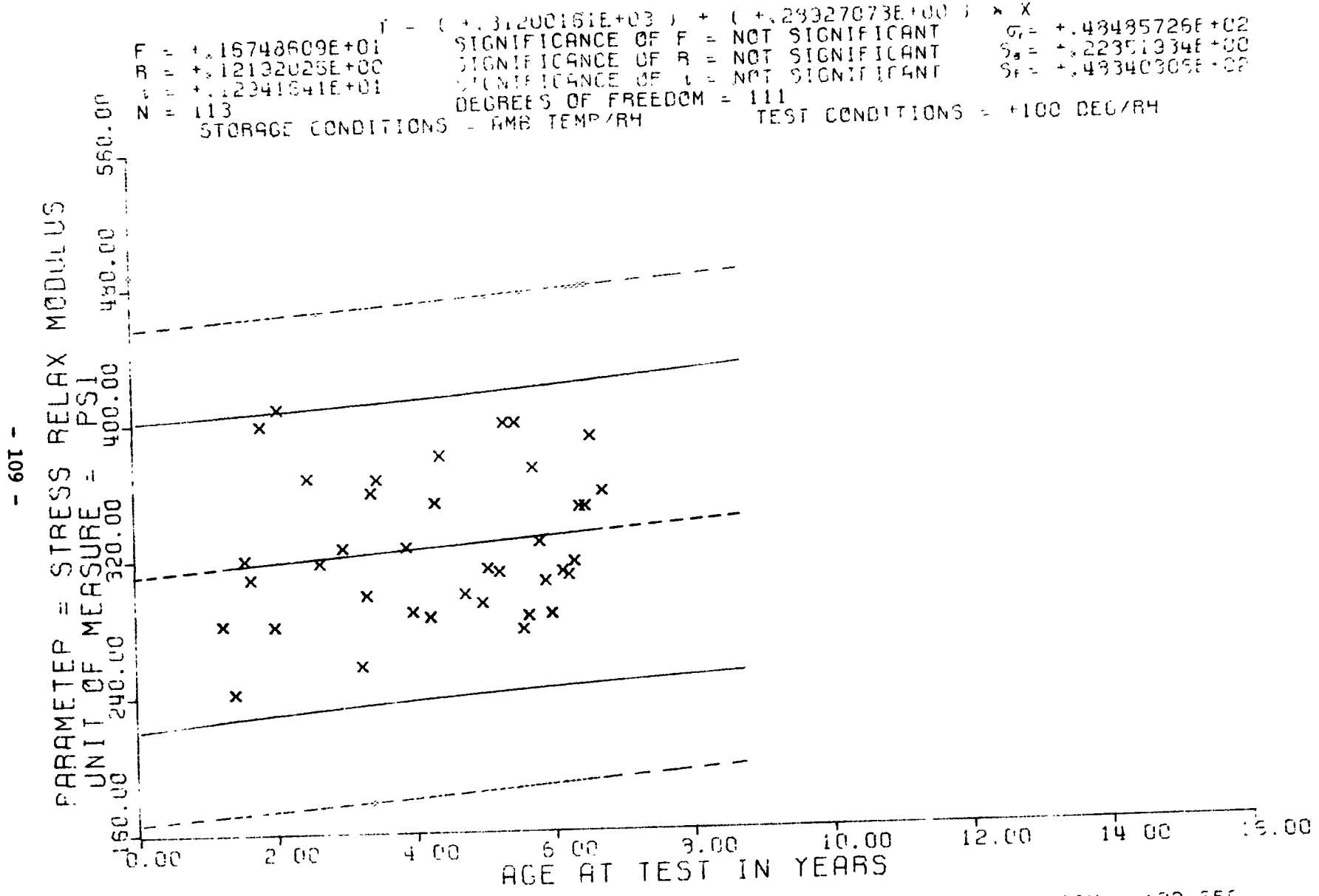
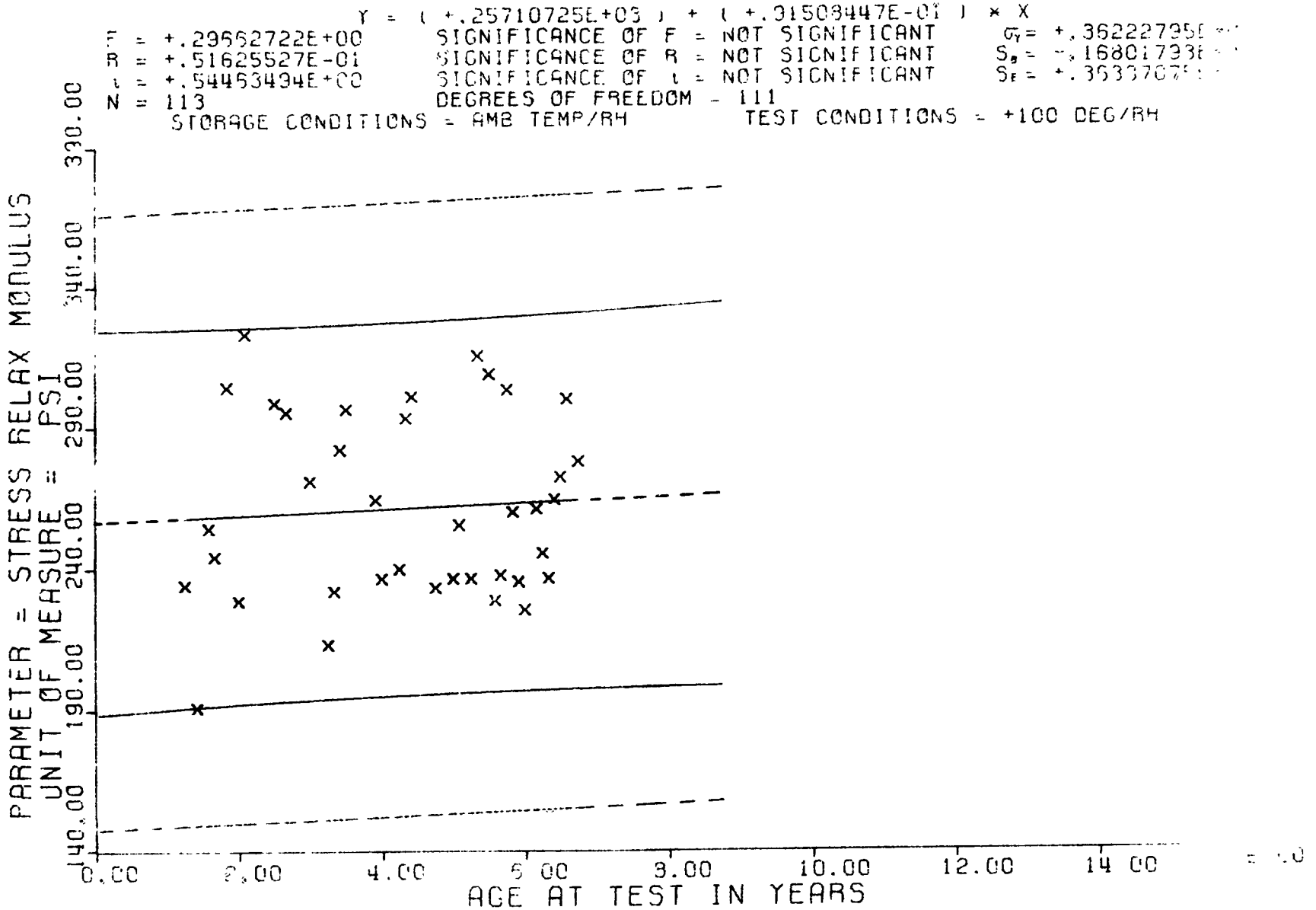

Y = (+.31200161E+03) + (+.29327073E+00) * X
F = +.16748609E+01
SIGNIFICANCE OF F = NOT SIGNIFICANT
σr = +.48485726E+02
R = +.12132025E+00
SIGNIFICANCE OF R = NOT SIGNIFICANT
Sb = +.22351334E+00
Sr = +.48340309E+02
N = 113
DEGREES OF FREEDOM = 111
STORAGE CONDITIONS - AMB TEMP/RH
TEST CONDITIONS = +100 DEG/RH
PARAMETER = STRESS RELAX MODULUS
UNIT OF MEASURE = PSI
560.00
480.00
400.00
320.00
240.00
160.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
AGE AT TEST IN YEARS
STAGE I WING
H 1011 STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 100 SEC

Figure 49

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
15.0	3	39.0	3	60.0	3	72.0	3
17.0	3	40.0	3	61.0	3	74.0	3
19.0	3	41.0	3	63.0	3	75.0	3
20.0	3	42.0	3	64.0	3	76.0	2
22.0	3	47.0	3	66.0	3	77.0	3
24.0	3	48.0	3	67.0	3	78.0	3
25.0	3	51.0	3	68.0	3	79.0	3
30.0	3	52.0	3	69.0	3	81.0	3
32.0	3	53.0	3	70.0	3		113
36.0	3	57.0	3	71.0	3		

Stage 1 Wing 6, TP-H 1011 Stress Relaxation Modulus, 3 Percent Strain, 1000 Sec
+100°



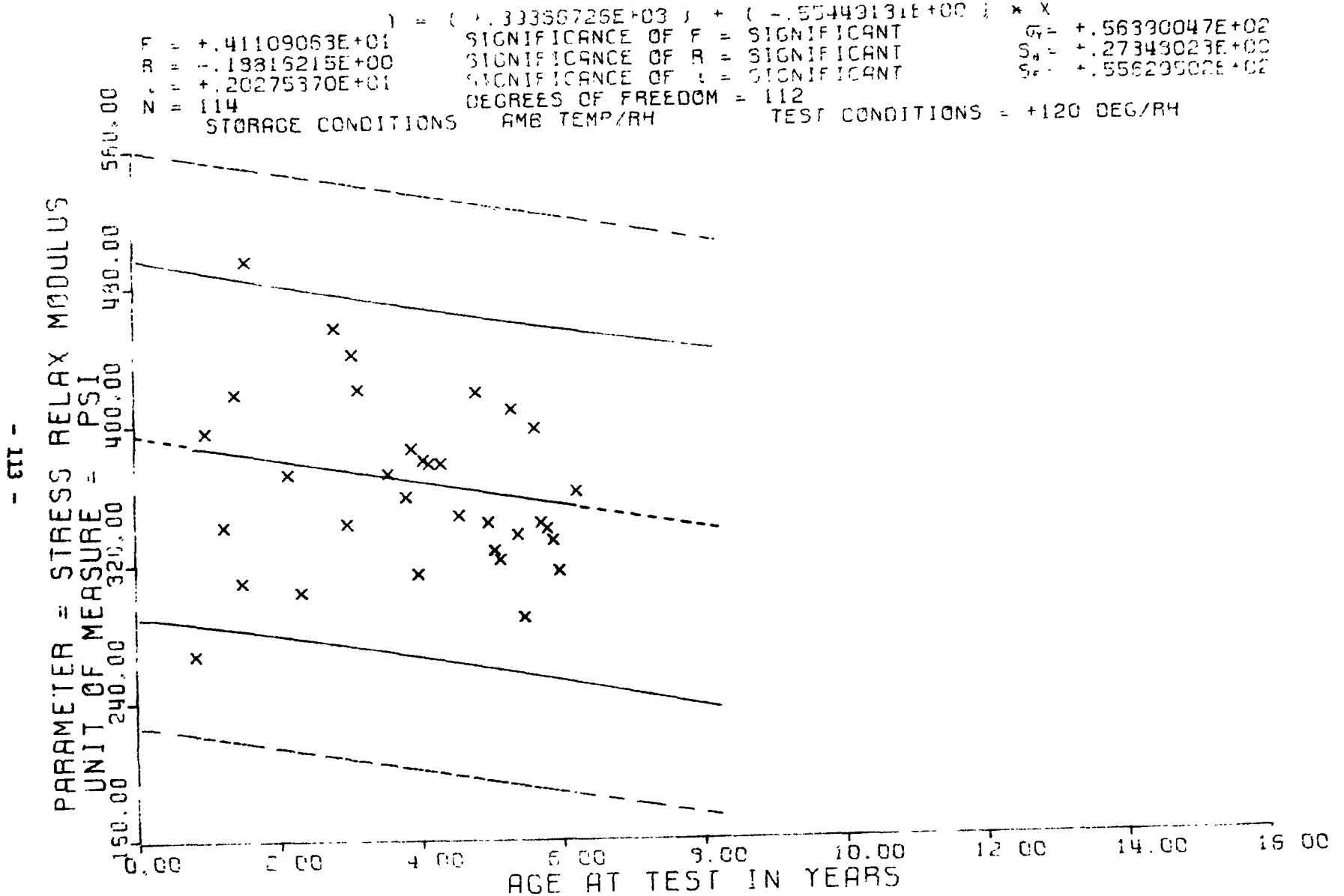
STAGE 1 WING S, TP-H 1011 STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 1000 SE

Figure 50

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
10.0	3	36.0	3	52.0	3	68.0	3
12.0	3	37.0	3	55.0	3	69.0	3
15.0	3	38.0	3	58.0	3	70.0	6
17.0	3	43.0	3	60.0	6	71.0	3
18.0	3	46.0	3	61.0	3	72.0	3
19.0	3	47.0	6	62.0	3	75.0	3
26.0	3	48.0	3	64.0	6		114
28.0	3	49.0	3	65.0	3		
34.0	6	50.0	3	66.0	3		

Stage 1 Wing 6, TP-H 1011 Stress Relaxation Modulus, 3 Percent Strain, 10 Sec
+120°



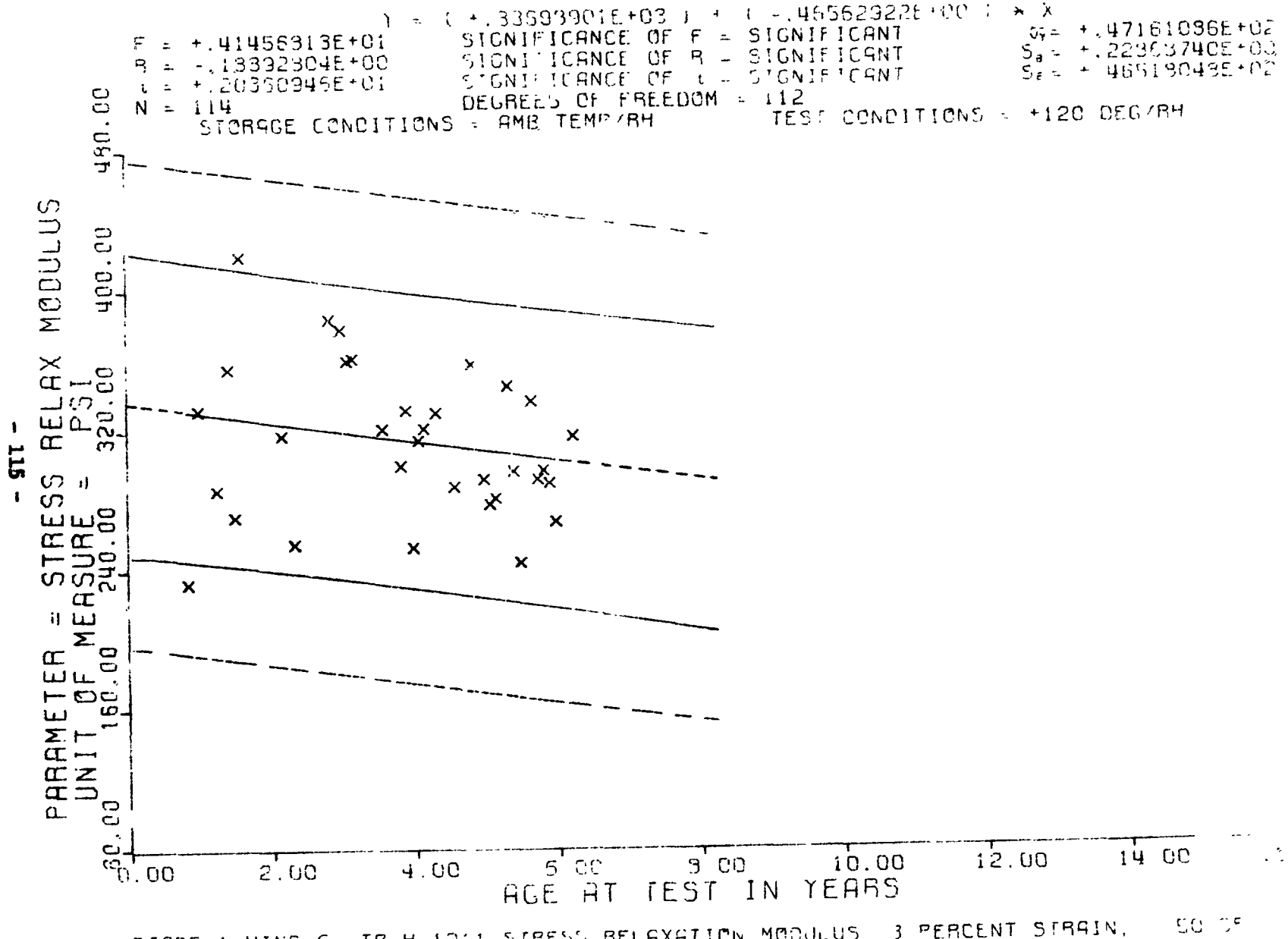
STAGE I WING 6 TP-H 1011 STRESS RELAXATION MODULUS. 3 PERCENT STRAIN, 10 SEC

Figure 51

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
10.0	3	36.0	3	52.0	3	68.0	3
12.0	3	37.0	3	55.0	3	69.0	3
15.0	3	38.0	3	58.0	3	70.0	6
17.0	3	43.0	3	60.0	6	71.0	3
18.0	3	46.0	3	61.0	3	72.0	3
19.0	3	47.0	6	62.0	3	75.0	3
26.0	3	48.0	3	64.0	6		114
28.0	3	49.0	3	65.0	3		
34.0	6	50.0	3	66.0	3		

Stage 1 Wing 6, TP-H 1011 Stress Relaxation Modulus, 3 Percent Strain, 50 Sec
+120°



STAGE 1 WING 6 TP-H 1011 STRESS RELAXATION MODULUS 3 PERCENT STRAIN, 50 °F

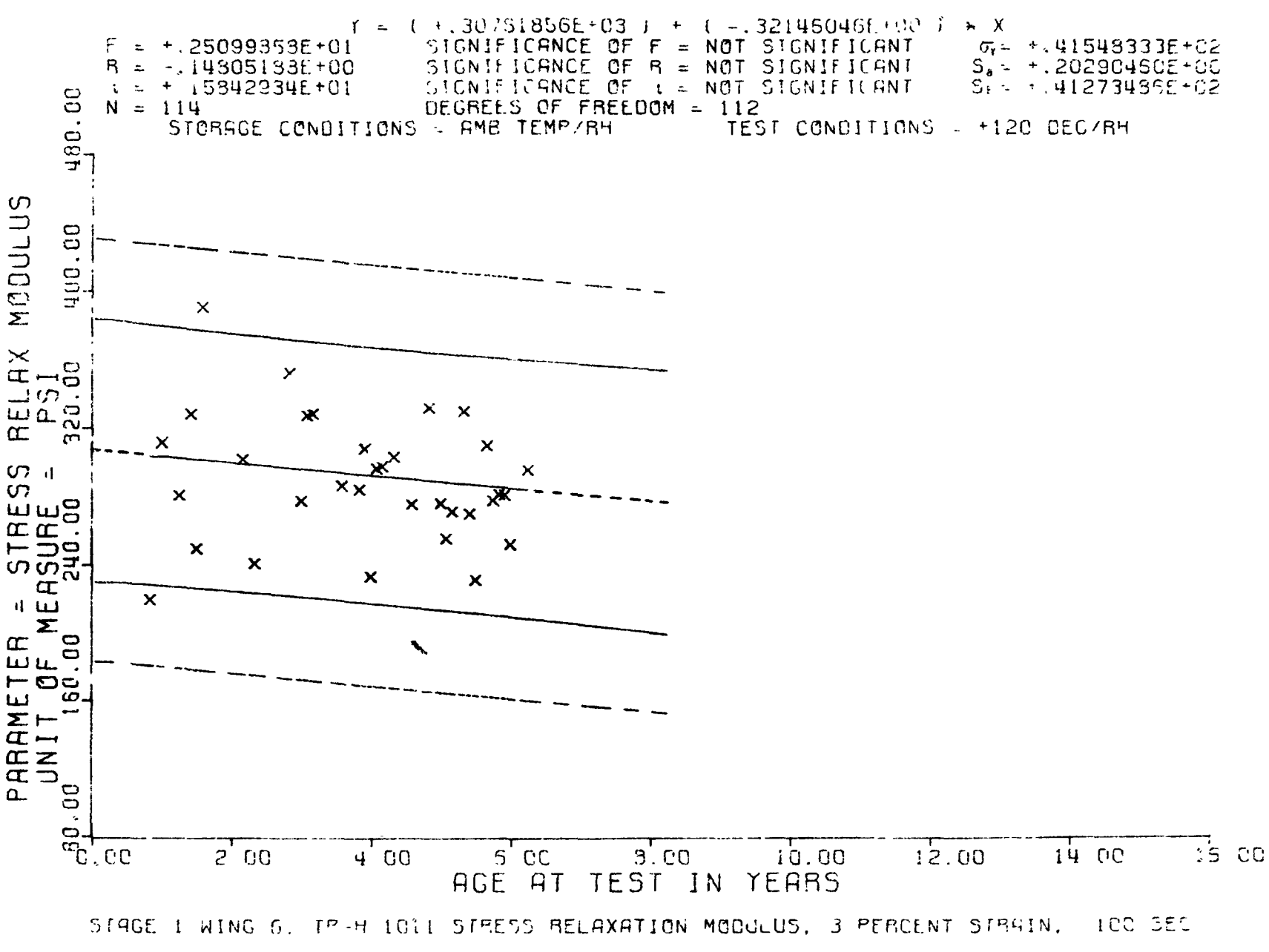
Figure 52

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
10.0	3	36.0	3	52.0	3	68.0	3
12.0	3	37.0	3	55.0	3	69.0	3
15.0	3	38.0	3	58.0	3	70.0	6
17.0	3	43.0	3	60.0	6	71.0	3
18.0	3	46.0	3	61.0	3	72.0	3
19.0	3	47.0	6	62.0	3	75.0	3
26.0	3	48.0	3	64.0	6		114
28.0	3	49.0	3	65.0	3		
34.0	6	50.0	3	66.0	3		

Stage 1 Wing 6, TP-H 1011 Stress Relaxation Modulus, 3 Percent Strain, 100 Sec

+120°



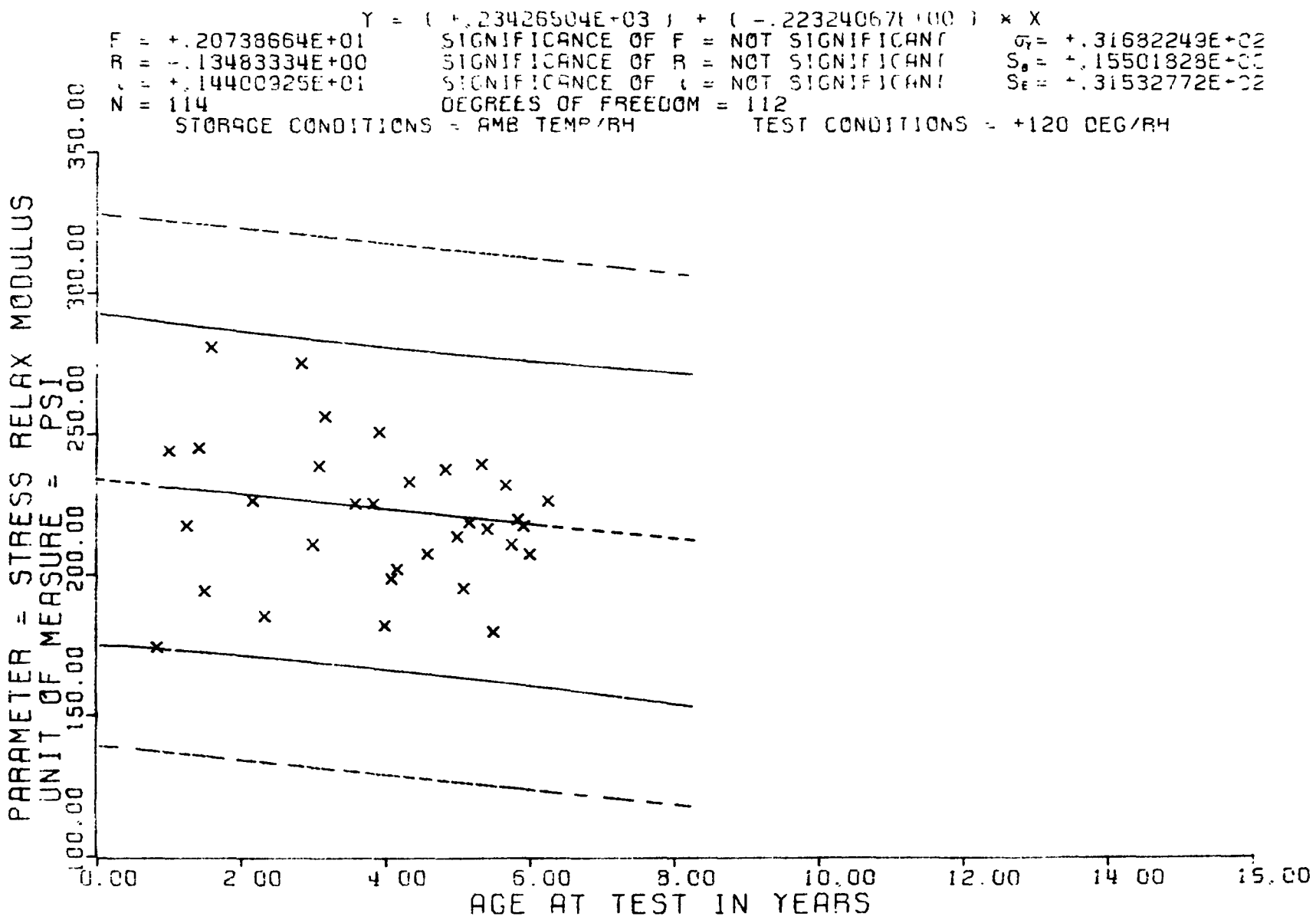
STAGE I WING G, TF-H 1011 STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 100 SEC

Figure 53

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
10.0	3	36.0	3	52.0	3	68.0	3
12.0	3	37.0	3	55.0	3	69.0	3
15.0	3	38.0	3	58.0	3	70.0	6
17.0	3	43.0	3	60.0	6	71.0	3
18.0	3	46.0	3	61.0	3	72.0	3
19.0	3	47.0	6	62.0	3	75.0	3
26.0	3	48.0	3	64.0	6		114
28.0	3	49.0	3	65.0	3		
34.0	6	50.0	3	66.0	3		

Stage 1 Wing 6, TP-H 1011 Stress Relaxation Modulus, 3 Percent Strain, 1000 Sec
+120°



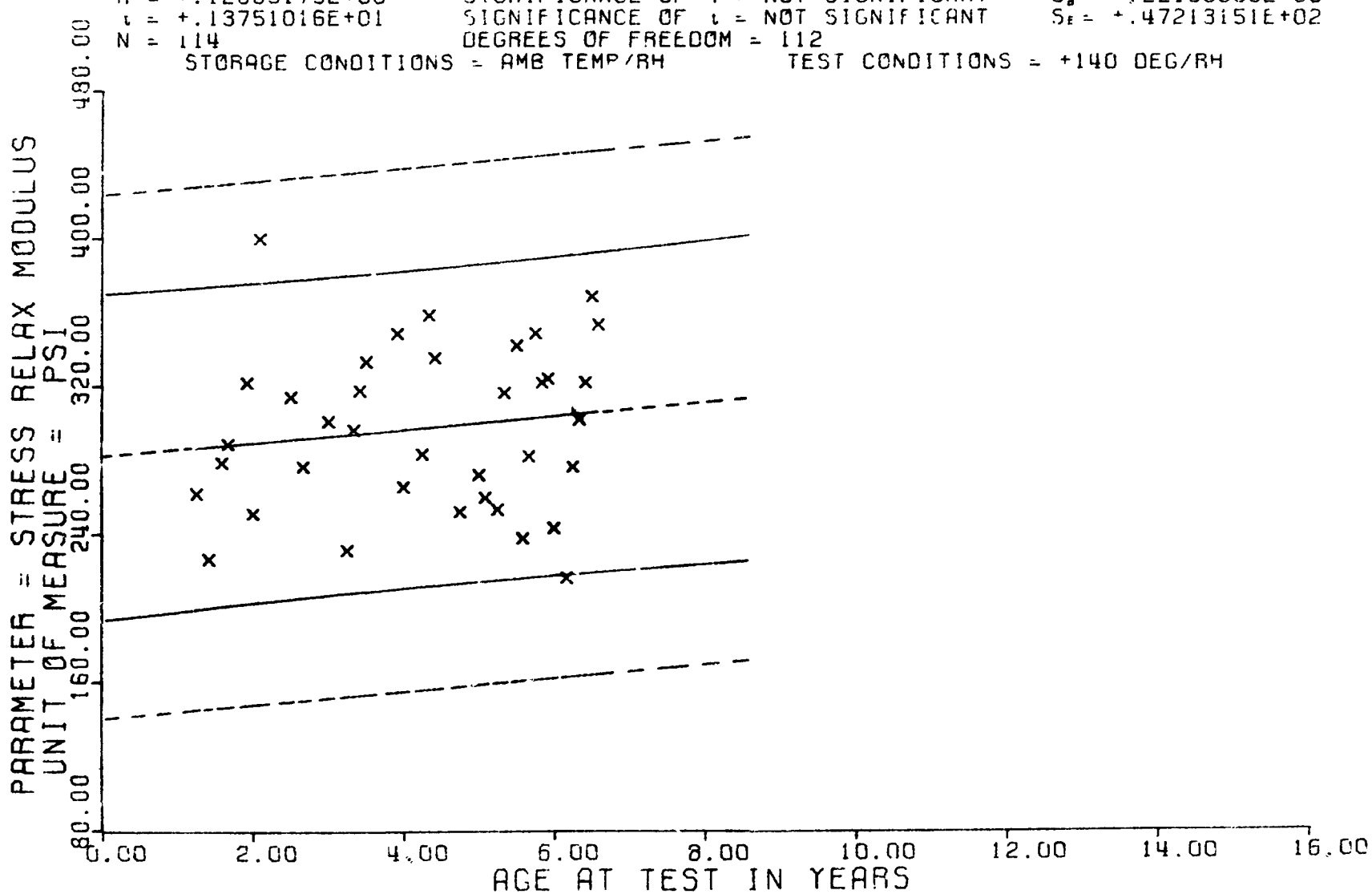
STAGE I WING G, TF H 1011 STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 1000 SEC

Figure 54

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
15.0	3	39.0	3	60.0	3	72.0	3
17.0	3	40.0	3	61.0	3	74.0	3
19.0	3	41.0	3	63.0	3	75.0	3
20.0	3	42.0	3	64.0	3	76.0	3
23.0	3	47.0	3	66.0	3	77.0	3
24.0	3	48.0	3	67.0	3	78.0	3
25.0	3	51.0	3	68.0	3	79.0	3
30.0	3	52.0	3	69.0	6		114
32.0	3	53.0	3	70.0	3		
36.0	3	57.0	3	71.0	3		

Stage 1 Wing 6, TP-H 1011 Stress Relaxation Modulus, 3 Percent Strain, 10 Sec
+140°



STAGE I WING 6, TP-H 1011 STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 10 SEC

Figure 55

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
15.0	3	39.0	3	60.0	3	72.0	3
17.0	3	40.0	3	61.0	3	74.0	3
19.0	3	41.0	3	63.0	3	75.0	3
20.0	3	42.0	3	64.0	3	76.0	3
23.0	3	47.0	3	66.0	3	77.0	3
24.0	3	48.0	3	67.0	3	78.0	3
25.0	3	51.0	3	68.0	3	79.0	3
30.0	3	52.0	3	69.0	6		114
32.0	3	53.0	3	70.0	3		
36.0	3	57.0	3	71.0	3		

Stage 1 Wing 6, TP-H 1011 Stress Relaxation Modulus, 3 Percent Strain, 50 Sec

+140°

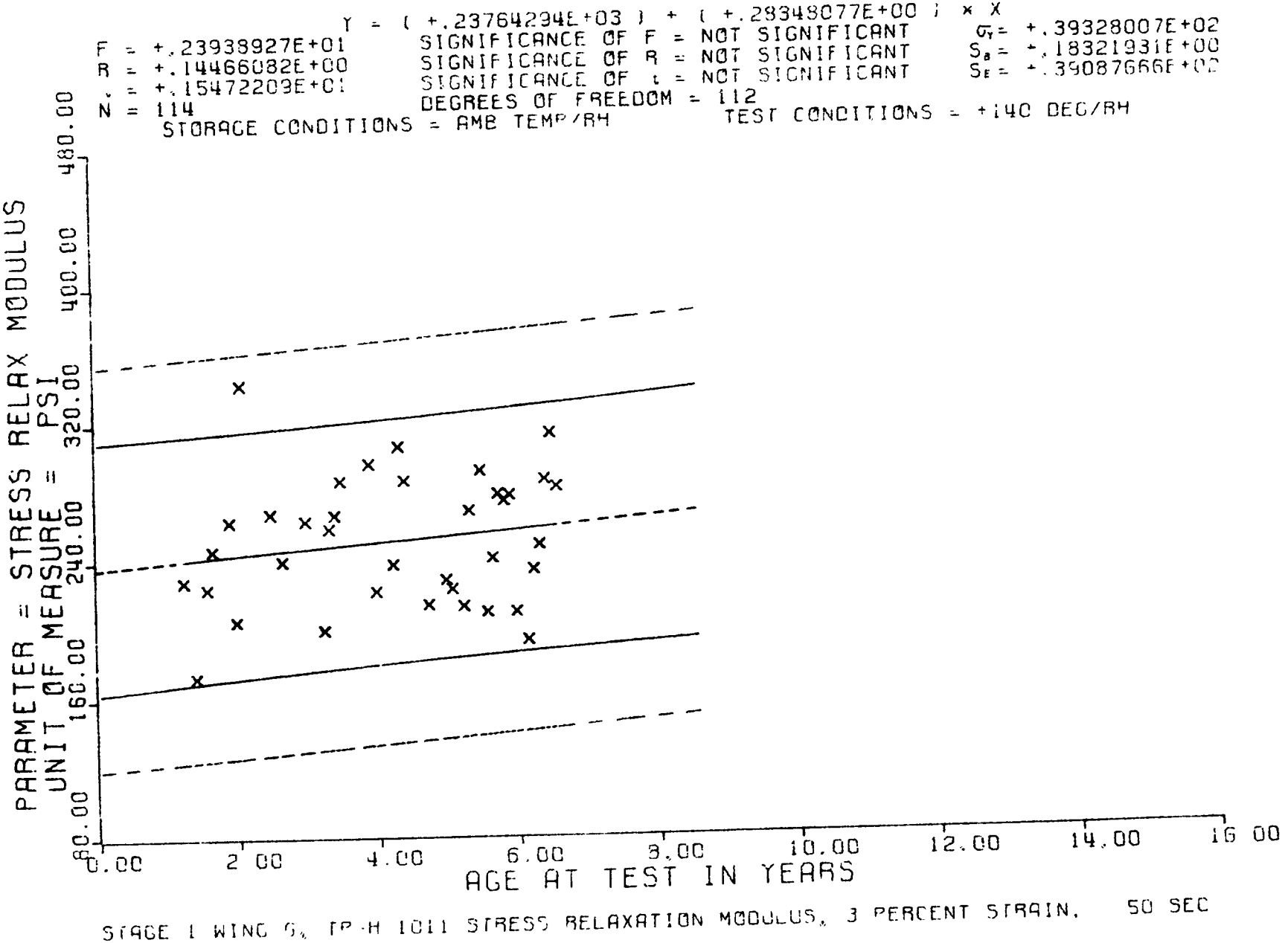
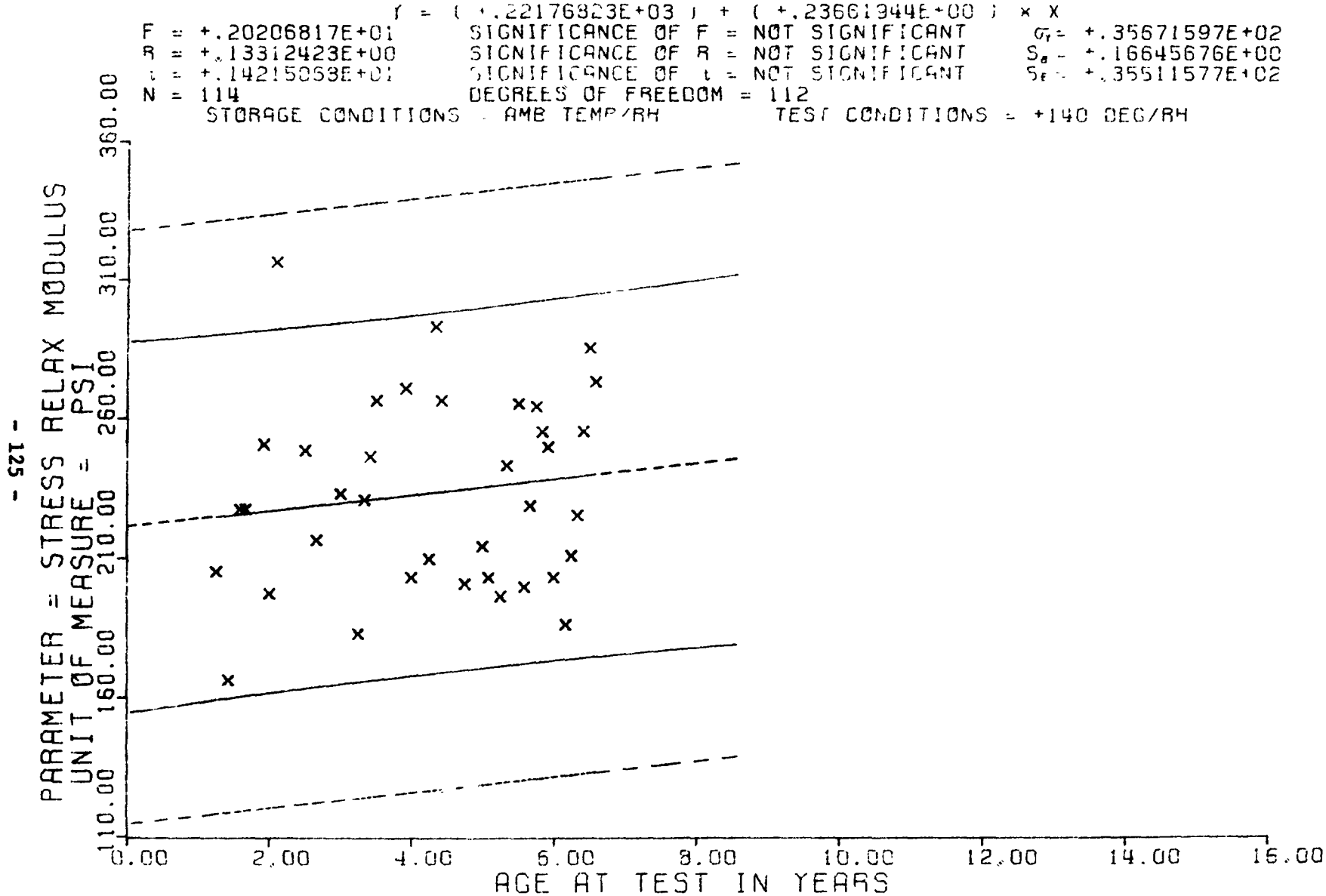

Y = (+.23764294E+03) + (+.28348077E+00) * X
F = +.23938927E+01
SIGNIFICANCE OF F = NOT SIGNIFICANT
σY = +.39328007E+02
R = +.14466082E+00
SIGNIFICANCE OF R = NOT SIGNIFICANT
Sa = +.18321931E+00
SE = +.15472209E+01
SIGNIFICANCE OF t = NOT SIGNIFICANT
SE = +.39087666E+02
N = 114
DEGREES OF FREEDOM = 112
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = +140 DEG/RH
PARAMETER = STRESS RELAX MODULUS
UNIT OF MEASURE = PSI
480.00
400.00
320.00
240.00
160.00
80.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST IN YEARS
STAGE I WING 6, TP-H 1011 STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 50 SEC

Figure 56

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
15.0	3	39.0	3	60.0	3	72.0	3
17.0	3	40.0	3	61.0	3	74.0	3
19.0	3	41.0	3	63.0	3	75.0	3
20.0	3	42.0	3	64.0	3	76.0	3
23.0	3	47.0	3	66.0	3	77.0	3
24.0	3	48.0	3	67.0	3	78.0	3
25.0	3	51.0	3	68.0	3	79.0	3
30.0	3	52.0	3	69.0	6		114
32.0	3	53.0	3	70.0	3		
36.0	3	57.0	3	71.0	3		

Stage 1 Wing 6, TP-H 1011 Stress Relaxation Modulus, 3 Percent Strain, 100 Sec
+140°



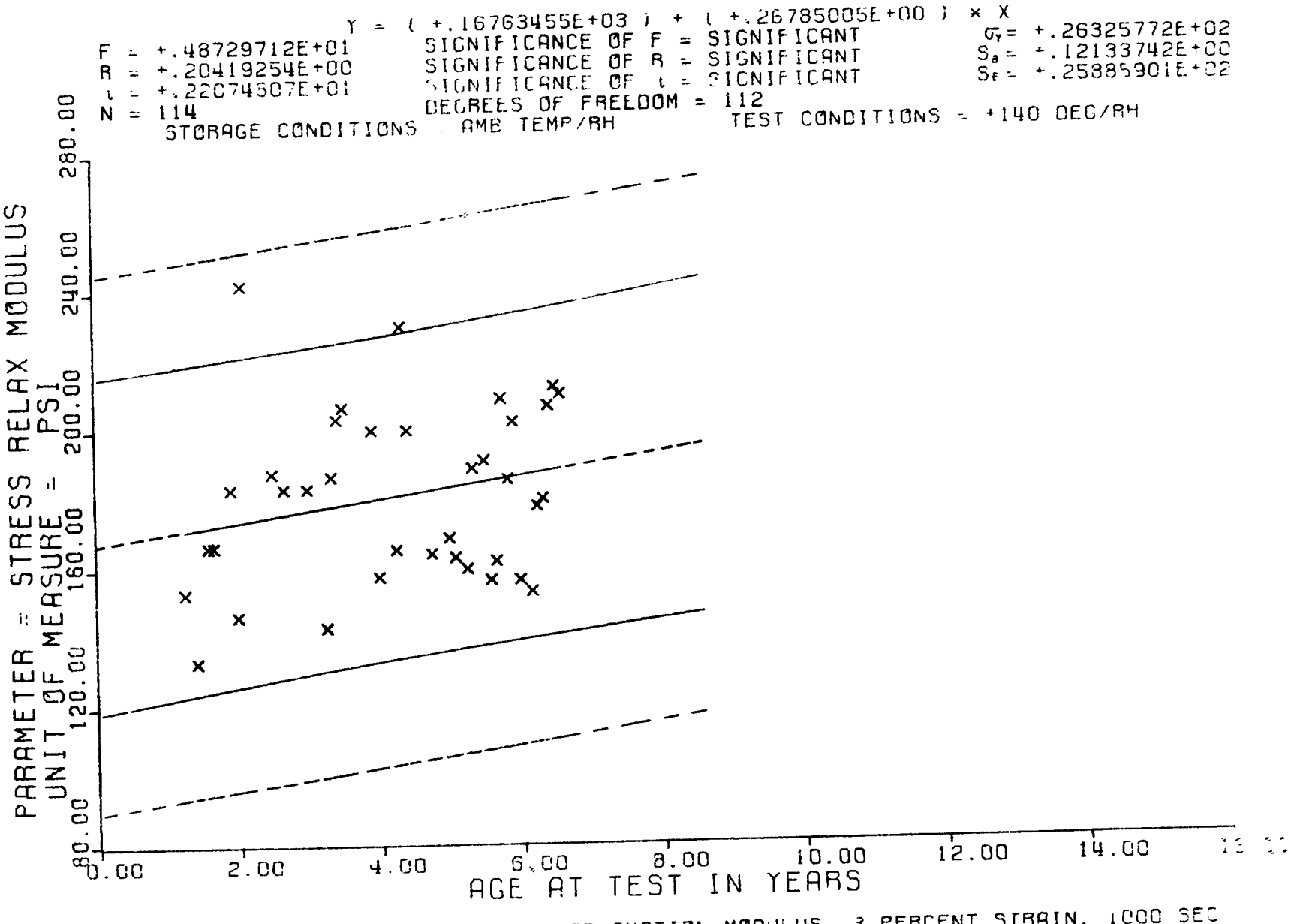
STAGE 1 WINC 6, TP-H 1011 STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 100 SEC

Figure 57

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
15.0	3	39.0	3	60.0	3	72.0	3
17.0	3	40.0	3	61.0	3	74.0	3
19.0	3	41.0	3	63.0	3	75.0	3
20.0	3	42.0	3	64.0	3	76.0	3
23.0	3	47.0	3	66.0	3	77.0	3
24.0	3	48.0	3	67.0	3	78.0	3
25.0	3	51.0	3	68.0	3	79.0	3
30.0	3	52.0	3	69.0	6		114
32.0	3	53.0	3	70.0	3		
36.0	3	57.0	3	71.0	3		

Stage 1 Wing 6, TP-H 1011 Stress Relaxation Modulus, 3 Percent Strain, 1000 Sec
+140°



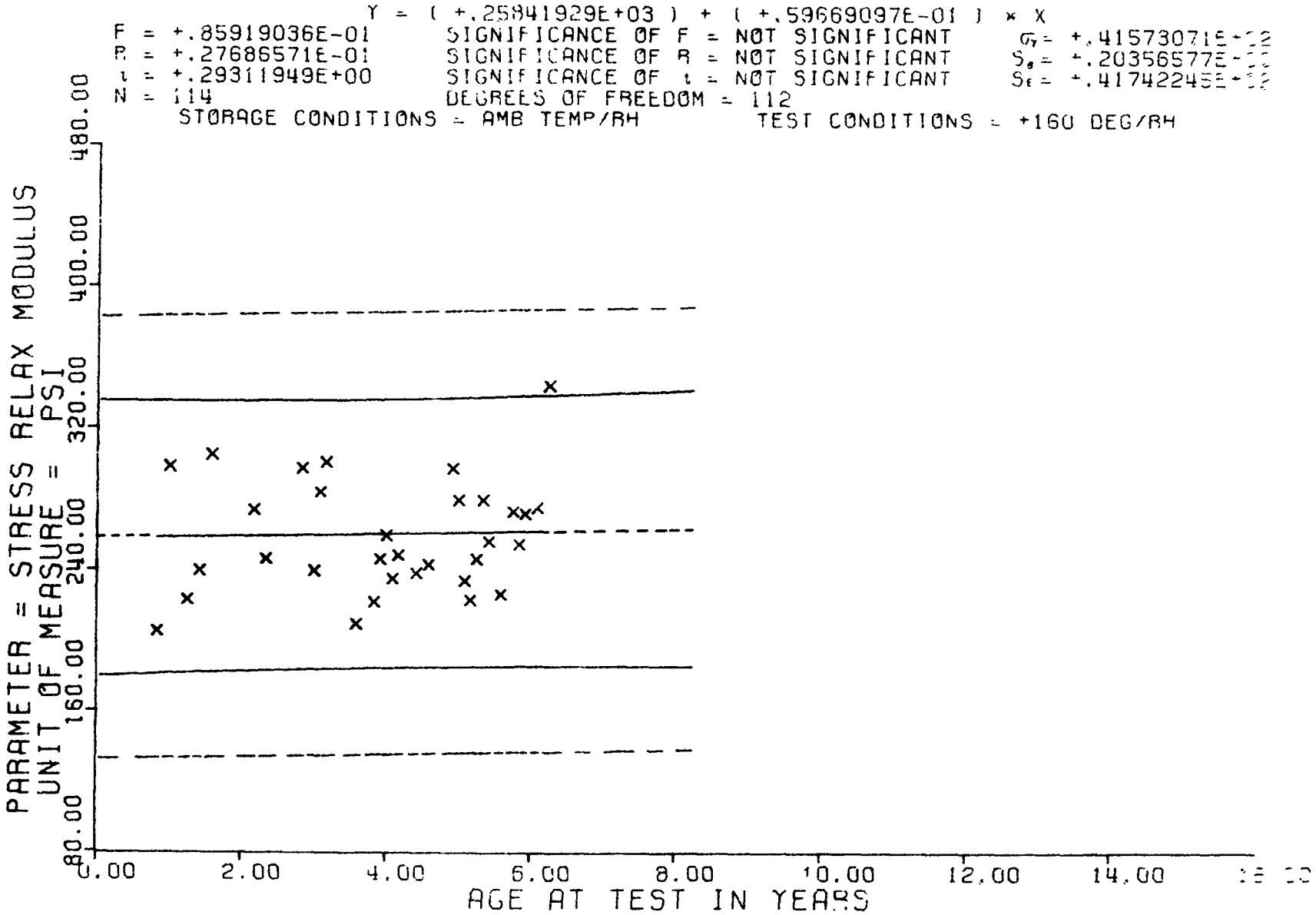
STAGE I WING 6, TP-H 1011 STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 1000 SEC

Figure 58

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
10.0	3	37.0	3	55.0	3	69.0	3
12.0	3	38.0	3	59.0	3	70.0	9
15.0	3	43.0	3	60.0	3	71.0	3
17.0	3	46.0	3	61.0	3	73.0	3
19.0	6	47.0	6	62.0	3	75.0	3
26.0	3	48.0	3	63.0	3		114
28.0	3	49.0	3	64.0	6		
34.0	6	50.0	3	65.0	3		
36.0	3	53.0	3	67.0	3		

Stage 1 Wing 6, TP-H 1011 Stress Relaxation Modulus, 3 Percent Strain, 10 Sec
+160°



STAGE 1 WING 6, TP-H 1011 STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 10 SEC

1

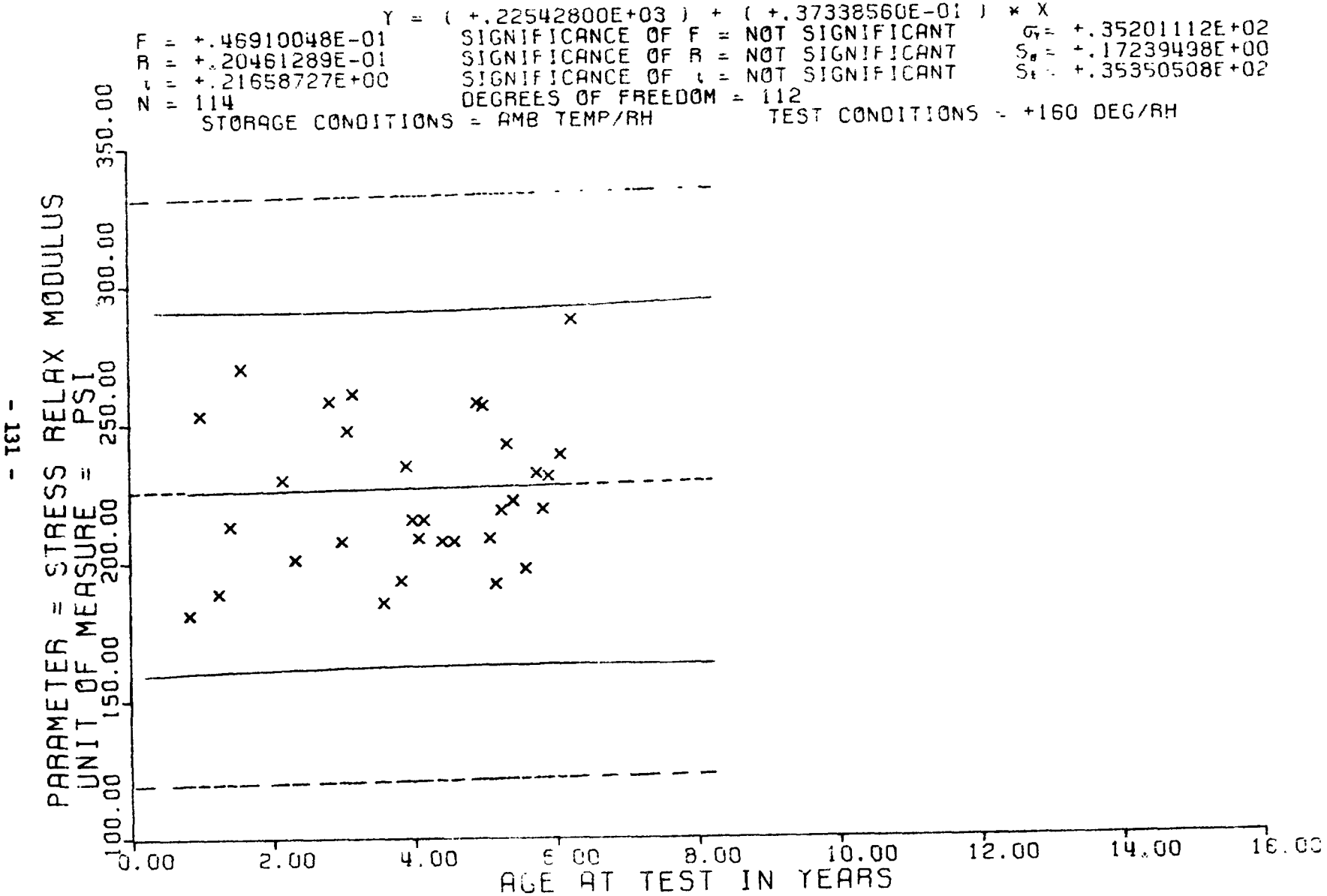
Figure 59

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
10.0	3	37.0	3	55.0	3	69.0	3
12.0	3	38.0	3	59.0	3	70.0	9
15.0	3	43.0	3	60.0	3	71.0	3
17.0	3	46.0	3	61.0	3	73.0	3
19.0	6	47.0	6	62.0	3	75.0	3
26.0	3	48.0	3	63.0	3		114
28.0	3	49.0	3	64.0	6		
34.0	6	50.0	3	65.0	3		
36.0	3	53.0	3	67.0	3		

Stage 1 Wing 6, TP-H 1011 Stress Relaxation Modulus, 3 Percent Strain, 50 Sec

+160°



STAGE 1 WING 6, TP-H 1011 STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 50 SEC

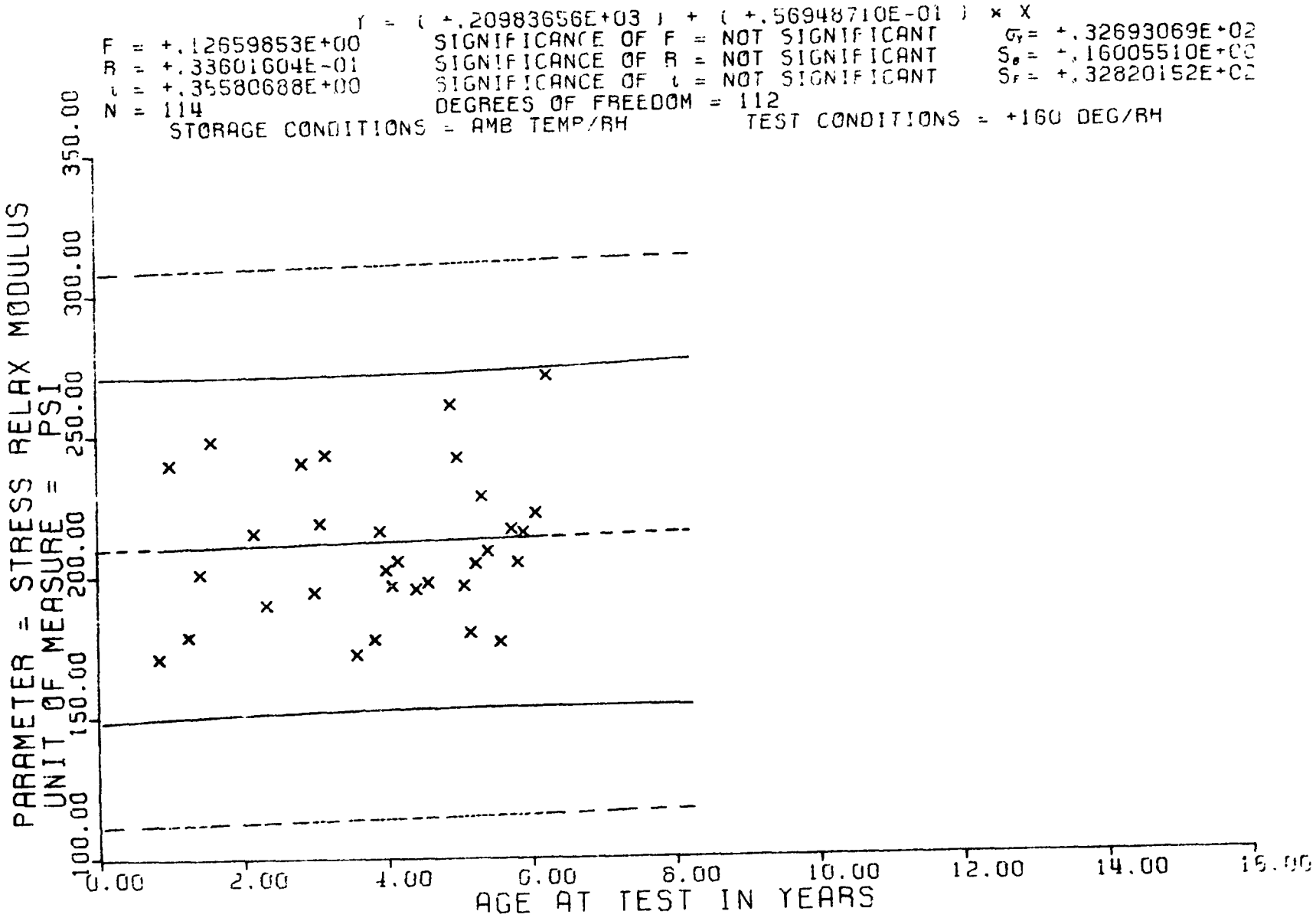
Figure 60

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
10.0	3	37.0	3	55.0	3	69.0	3
12.0	3	38.0	3	59.0	3	70.0	9
15.0	3	43.0	3	60.0	3	71.0	3
17.0	3	46.0	3	61.0	3	73.0	3
19.0	6	47.0	6	62.0	3	75.0	3
26.0	3	48.0	3	63.0	3		114
28.0	3	49.0	3	64.0	6		
34.0	6	50.0	3	65.0	3		
36.0	3	53.0	3	67.0	3		

Stage 1 Wing 6, TP-H 1011 Stress Relaxation Modulus, 3 Percent Strain, 100 Sec

+160°



STAGE 1 WING 6, TF-H 1011 STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 100 SEC

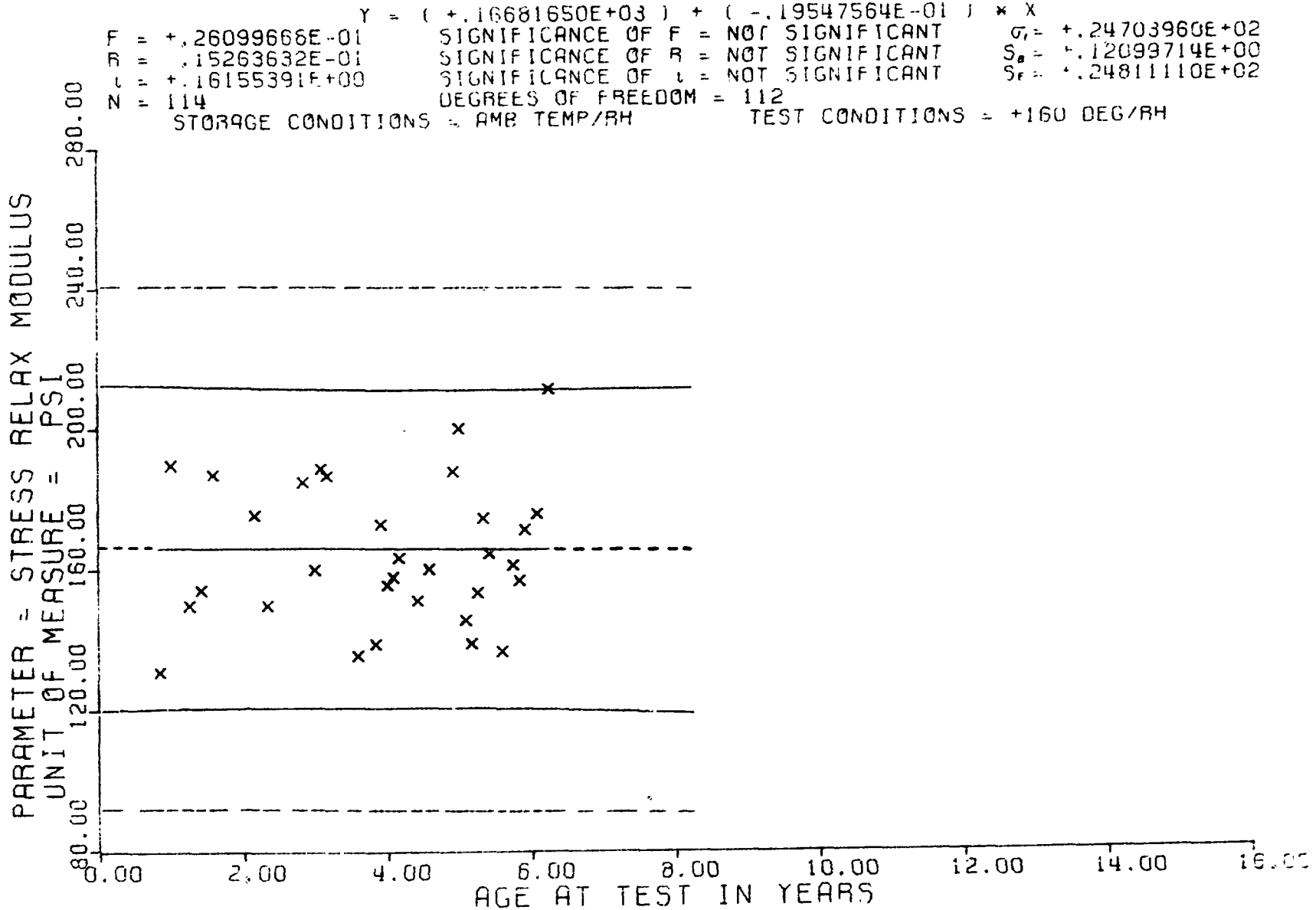
Figure 61

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
10.0	3	37.0	3	55.0	3	69.0	3
12.0	3	38.0	3	59.0	3	70.0	9
15.0	3	43.0	3	60.0	3	71.0	3
17.0	3	46.0	3	61.0	3	73.0	3
19.0	6	47.0	6	62.0	3	75.0	3
26.0	3	48.0	3	63.0	3		114
28.0	3	49.0	3	64.0	6		
34.0	6	50.0	3	65.0	3		
36.0	3	53.0	3	67.0	3		

Stage 1 Wing 6, TP-H 1011 Stress Relaxation Modulus, 3 Percent Strain, 1000 Sec

+160°



STAGE 1 WING 6, TP-H 1011 STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 1000 SEC

Figure 62

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
10.0	3	40.0	3	63.0	6
12.0	3	41.0	3	64.0	6
15.0	6	42.0	3	65.0	6
17.0	6	43.0	3	66.0	3
19.0	9	46.0	3	67.0	6
20.0	3	47.0	6	68.0	3
23.0	3	48.0	9	69.0	6
24.0	3	49.0	3	70.0	11
25.0	3	50.0	3	71.0	3
26.0	3	51.0	3	72.0	6
28.0	3	52.0	3	73.0	3
30.0	3	53.0	6	75.0	9
32.0	3	56.0	3	76.0	6
34.0	3	57.0	3	77.0	3
35.0	3	59.0	3	79.0	3
36.0	6	60.0	6	81.0	3
38.0	3	61.0	6		227
39.0	6	62.0	3		

Stage 1 Wing 6, TP-H 1011 Stress Relaxation Modulus, 3 Percent Strain, 10 Sec

+130°

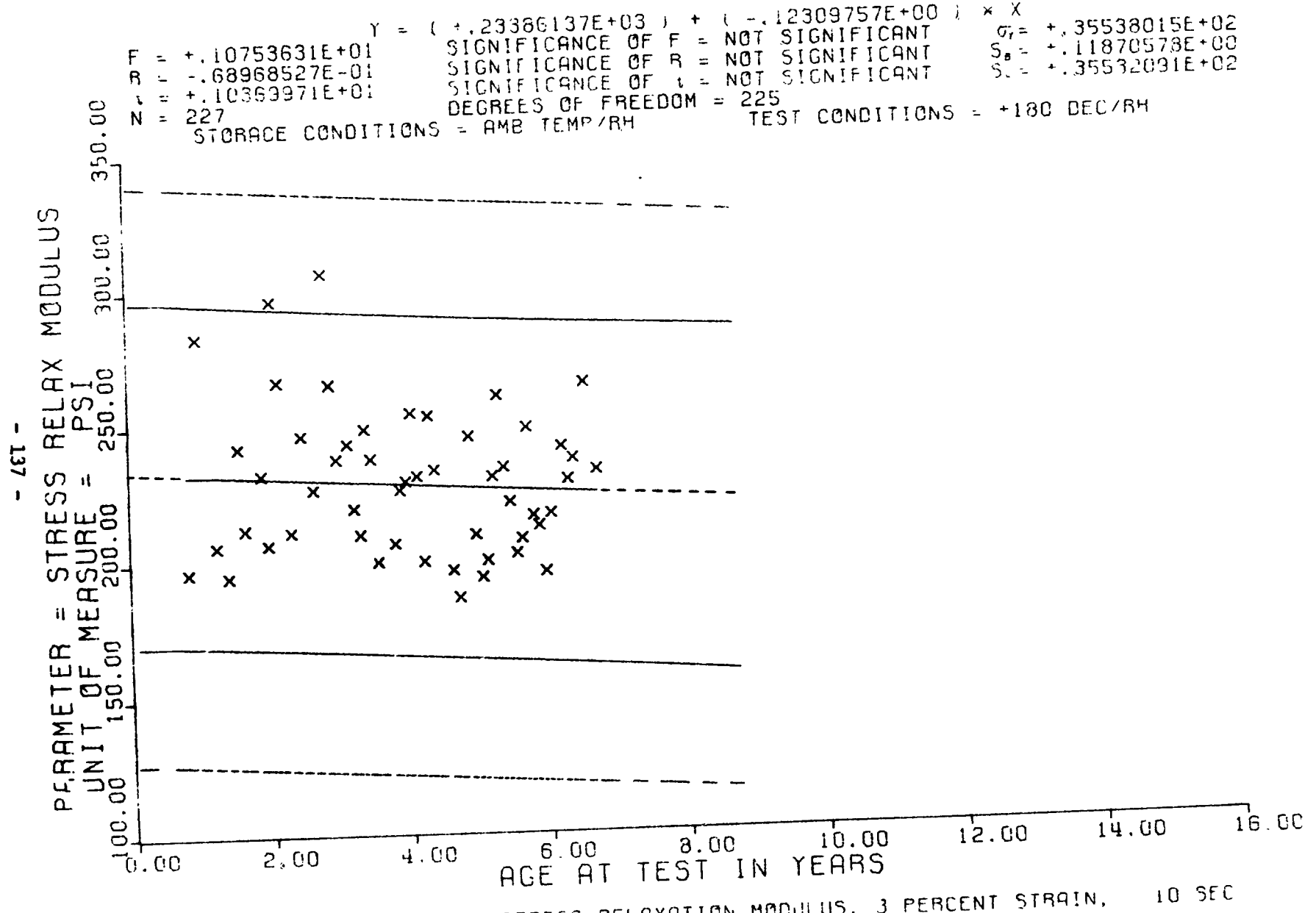

Y = (+.23386137E+03) + (-.12309757E+00) × X
F = +.10753631E+01
R = -.68968527E-01
N = 227
SIGNIFICANCE OF F = NOT SIGNIFICANT
SIGNIFICANCE OF R = NOT SIGNIFICANT
SIGNIFICANCE OF t = NOT SIGNIFICANT
DEGREES OF FREEDOM = 225
σy = +.35538015E+02
Se = +.11870578E+00
Sc = +.35532091E+02
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = +180 DEG/RH
PARAMETER = STRESS RELAX MODULUS
UNIT OF MEASURE = PSI
350.00
300.00
250.00
200.00
150.00
100.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST IN YEARS
STAGE 1 WING 6, TP-H 1011 STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 10 SEC

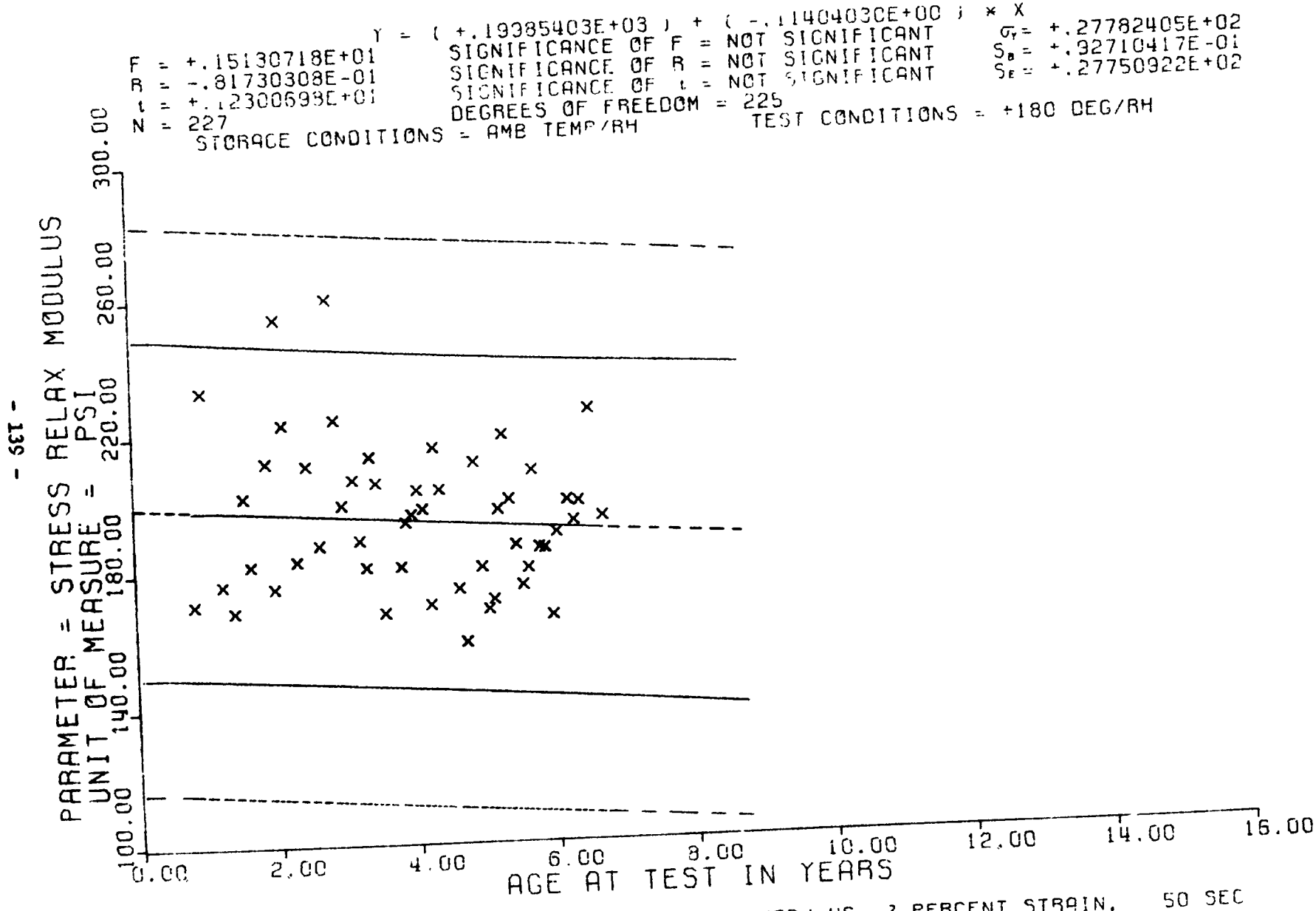
Figure 63

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
10.0	3	41.0	3	65.0	6
12.0	3	42.0	3	66.0	3
15.0	6	43.0	3	67.0	6
17.0	6	46.0	3	68.0	3
19.0	9	47.0	6	69.0	6
20.0	3	48.0	9	70.0	11
23.0	3	49.0	3	71.0	3
24.0	3	50.0	3	72.0	6
25.0	3	51.0	3	73.0	3
26.0	3	52.0	3	75.0	9
28.0	3	53.0	6	76.0	6
30.0	3	56.0	3	77.0	3
32.0	3	57.0	3	79.0	3
34.0	3	59.0	3	81.0	3
35.0	3	60.0	6		227
36.0	6	61.0	6		
38.0	3	62.0	3		
39.0	6	63.0	6		
40.0	3	64.0	6		

Stage 1 Wing 6, TP-H 1011 Stress Relaxation Modulus, 3 Percent Strain, 50 Sec

+180°



STAGE 1 WING 6, TP-H 1011 STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 50 SEC

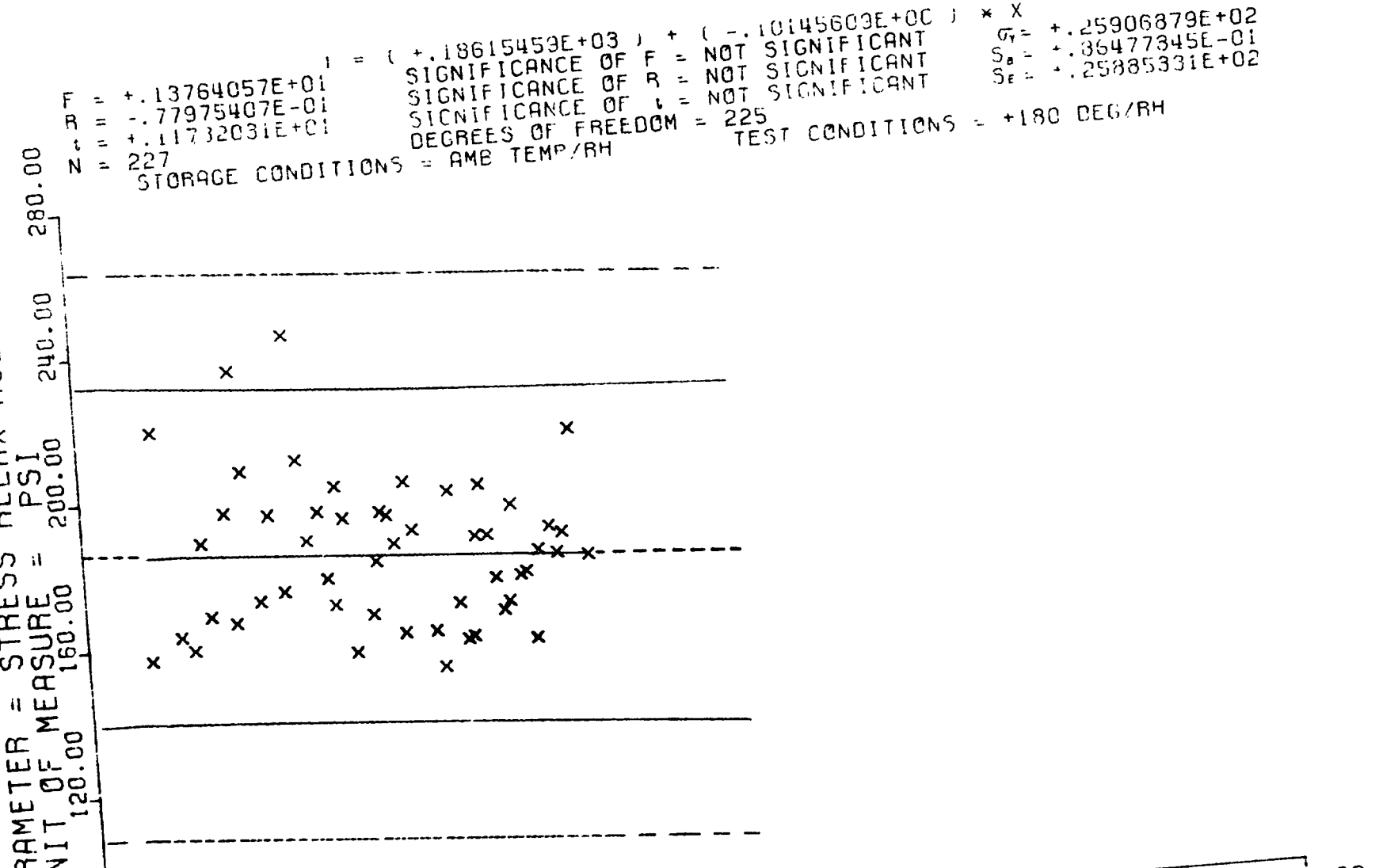
Figure 64

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
10.0	3	41.0	3	65.0	6
12.0	3	42.0	3	66.0	3
15.0	6	43.0	3	67.0	6
17.0	6	46.0	3	68.0	3
19.0	9	47.0	6	69.0	6
20.0	3	48.0	9	70.0	11
23.0	3	49.0	3	71.0	3
24.0	3	50.0	3	72.0	6
25.0	3	51.0	3	73.0	3
26.0	3	52.0	3	75.0	9
28.0	3	53.0	6	76.0	6
30.0	3	56.0	3	77.0	3
32.0	3	57.0	3	79.0	3
34.0	3	59.0	3	81.0	3
35.0	3	60.0	6		227
36.0	6	61.0	6		
38.0	3	62.0	3		
39.0	6	63.0	6		
40.0	3	64.0	6		

Stage 1 Wing 6, TP-H 1011 Stress Relaxation Modulus, 3 Percent Strain, 100 Sec

+180°



STAGE 1 WING G, TP-H 1011 STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 100 SEC

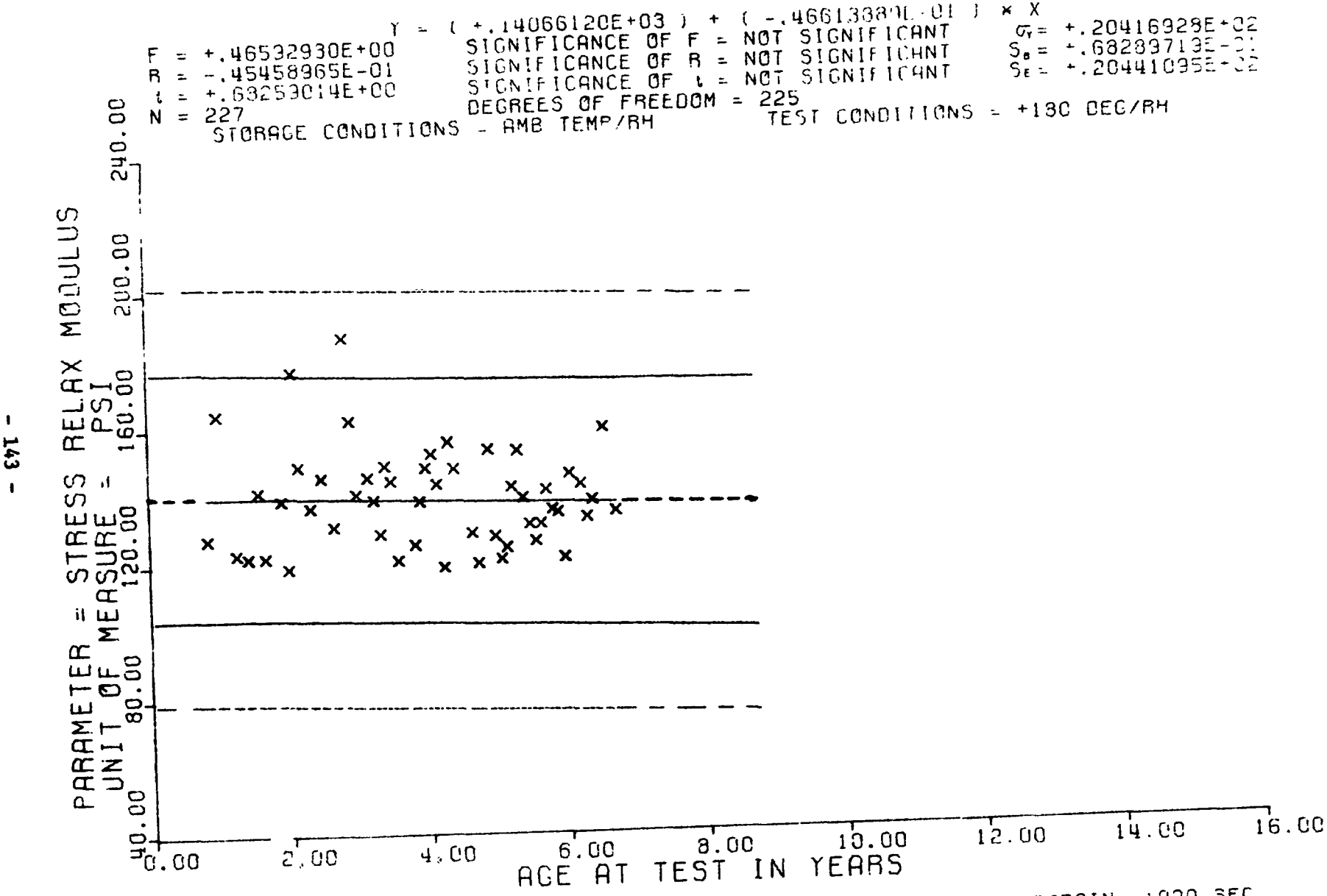
Figure 65

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
10.0	3	41.0	3	65.0	6
12.0	3	42.0	3	66.0	3
15.0	6	43.0	3	67.0	6
17.0	6	46.0	3	68.0	3
19.0	9	47.0	6	69.0	6
20.0	3	48.0	9	70.0	11
23.0	3	49.0	3	71.0	3
24.0	3	50.0	3	72.0	6
25.0	3	51.0	3	73.0	3
26.0	3	52.0	3	75.0	9
28.0	3	53.0	6	76.0	6
30.0	3	56.0	3	77.0	3
32.0	3	57.0	3	79.0	3
34.0	3	59.0	3	81.0	3
35.0	3	60.0	6		227
36.0	6	61.0	6		
38.0	3	62.0	3		
39.0	6	63.0	6		
40.0	3	64.0	6		

Stage 1 Wing 6, TP-H 1011 Stress Relaxation Modulus, 3 Percent Strain, 1000 Sec

+180°



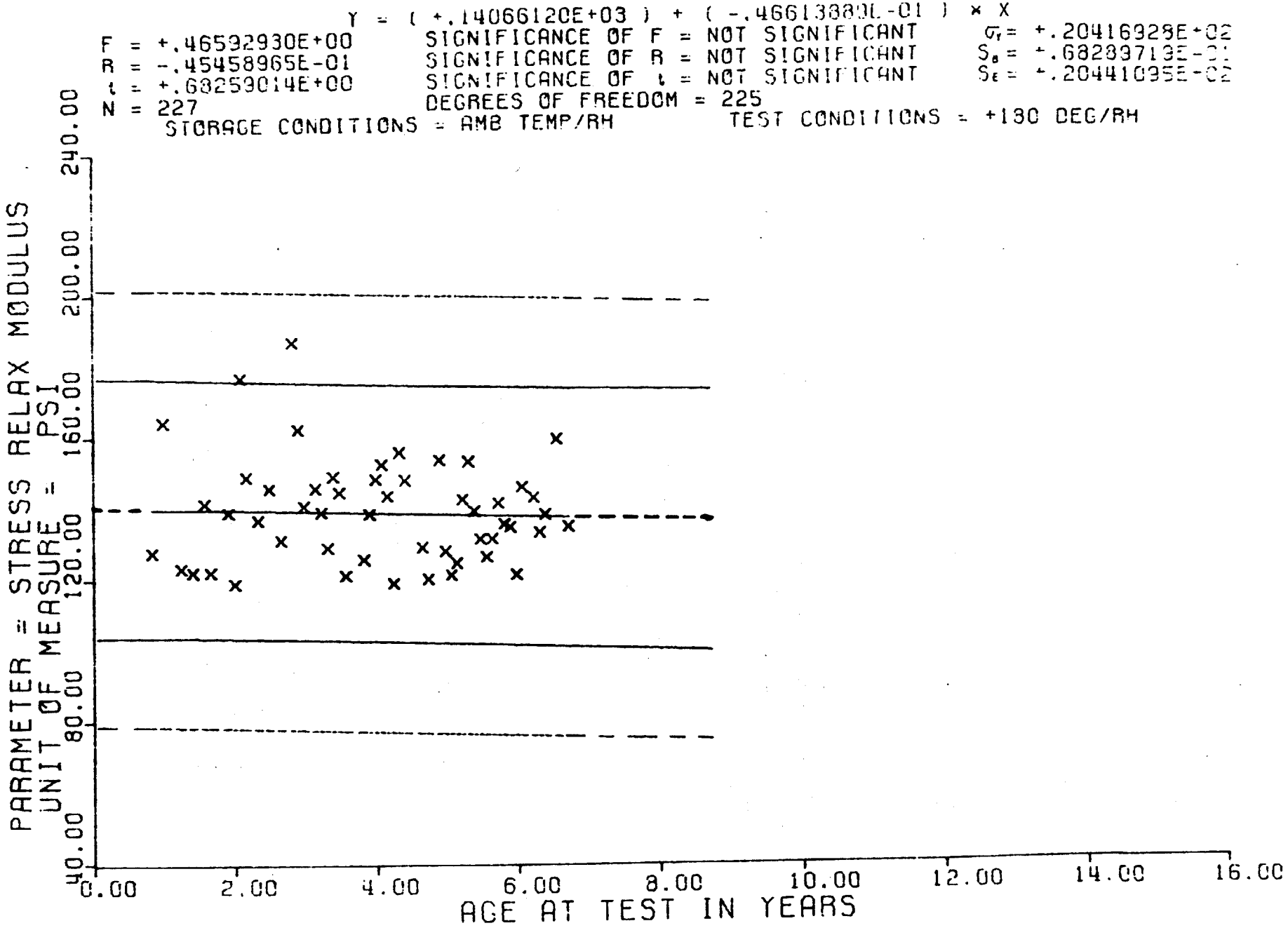
STAGE 1 WING G, TP-H 1011 STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 1000 SEC

Figure 66

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
2.0	3	21.0	5	48.0	10	70.0	15
3.0	15	23.0	5	49.0	15	71.0	15
4.0	8	25.0	5	50.0	5	72.0	10
5.0	11	26.0	5	52.0	5	73.0	5
6.0	23	28.0	5	53.0	10	75.0	5
7.0	18	31.0	11	54.0	5	76.0	10
8.0	21	32.0	14	56.0	10	77.0	9
9.0	24	33.0	13	58.0	5	78.0	6
10.0	28	34.0	6	59.0	5	80.0	5
11.0	24	35.0	12	60.0	5	81.0	5
12.0	28	37.0	10	61.0	10		722
13.0	28	38.0	5	62.0	5		
14.0	20	39.0	5	63.0	5		
15.0	28	40.0	10	64.0	5		
16.0	28	42.0	7	65.0	15		
17.0	9	43.0	5	66.0	5		
18.0	20	44.0	5	67.0	10		
19.0	8	46.0	5	68.0	10		
20.0	10	47.0	5	69.0	5		

Stage 1 Wing 6 TP-H 1011 Constant Strain



STAGE I WING G, TP-H 1011 STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 1000 SEC

Figure 66

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
3.0	3	21.0	3	49.0	4	72.0	2
4.0	7	23.0	6	52.0	3	73.0	4
5.0	4	24.0	5	53.0	7	74.0	4
6.0	4	25.0	4	54.0	2	75.0	2
7.0	6	26.0	2	55.0	4	76.0	7
8.0	3	31.0	2	56.0	2	77.0	3
9.0	13	32.0	5	58.0	4	78.0	2
10.0	18	33.0	9	59.0	2	80.0	2
11.0	21	34.0	4	60.0	2	81.0	2
12.0	16	36.0	1	61.0	6		307
13.0	11	37.0	2	62.0	2		
14.0	16	40.0	6	64.0	2		
15.0	6	41.0	2	66.0	4		
16.0	5	42.0	3	67.0	2		
17.0	2	43.0	2	68.0	4		
18.0	7	44.0	5	69.0	4		
19.0	1	45.0	1	70.0	8		
20.0	4	48.0	2	71.0	6		

Stage 1 Wing 6, TP-H 1011 Dynamic Response, Stor Shear Mod 200 HZ, 70 GM CT WT

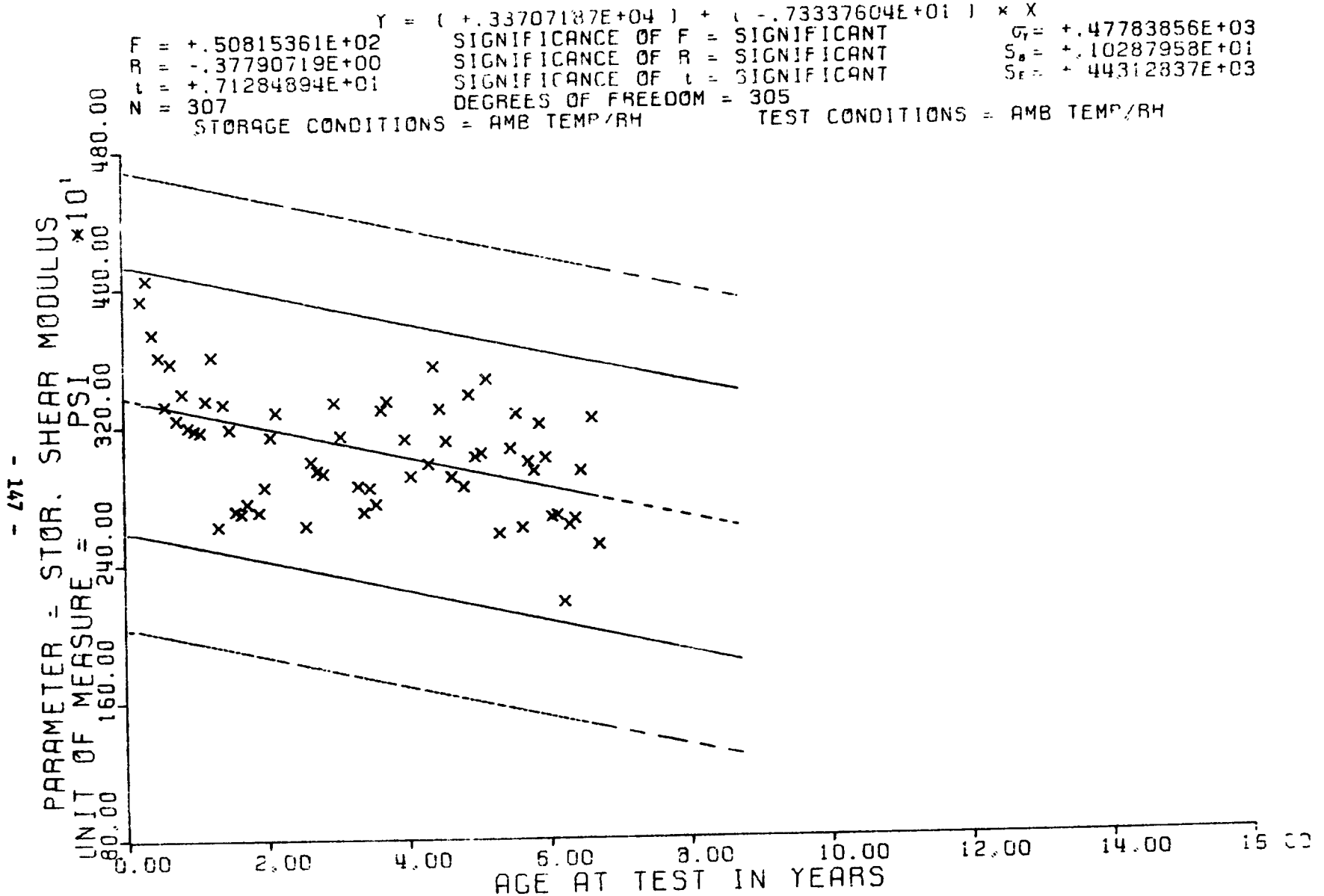
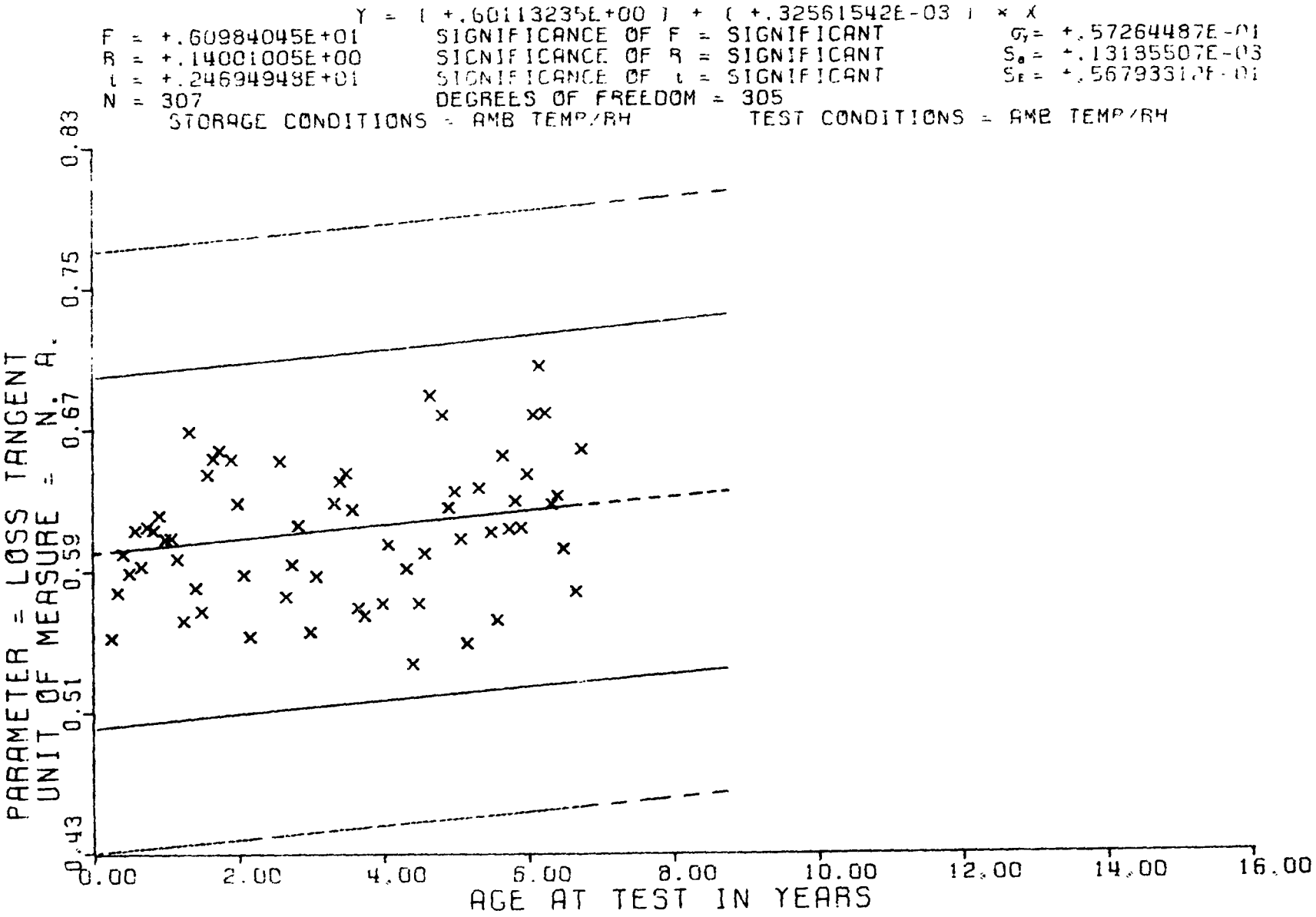

Y = (+.33707187E+04) + (-.73337604E+01) × X
F = +.50815361E+02
R = -.37790719E+00
t = +.71284894E+01
N = 307
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF t = SIGNIFICANT
DEGREES OF FREEDOM = 305
σr = +.47783856E+03
Sa = +.10287958E+01
Se = +.44312837E+03
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STOR. SHEAR MODULUS
UNIT OF MEASURE = PSI ×10¹
480.00
400.00
320.00
240.00
160.00
80.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
AGE AT TEST IN YEARS
STAGE 1 WING 6, TP-H 1011 DYNAMIC RESPONSE, STOR SHEAR MOD, 200 HZ, 70 GM CT WT

Figure 68

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
3.0	3	21.0	3	49.0	4	72.0	2
4.0	7	23.0	6	52.0	3	73.0	4
5.0	4	24.0	5	53.0	7	74.0	4
6.0	4	25.0	4	54.0	2	75.0	2
7.0	6	26.0	2	55.0	4	76.0	7
8.0	3	31.0	2	56.0	2	77.0	3
9.0	13	32.0	5	58.0	4	78.0	2
10.0	18	33.0	9	59.0	2	80.0	2
11.0	21	34.0	4	60.0	2	81.0	2
12.0	16	36.0	1	61.0	6		307
13.0	11	37.0	2	62.0	2		
14.0	16	40.0	6	64.0	2		
15.0	6	41.0	2	66.0	4		
16.0	5	42.0	3	67.0	2		
17.0	2	43.0	2	68.0	4		
18.0	7	44.0	5	69.0	4		
19.0	1	45.0	1	70.0	8		
20.0	4	48.0	2	71.0	6		

Stage 1 Wing 6, TP-H 1011 Dynamic Response, Loss Tangent, 200 HZ, 70 GM, CT, WT



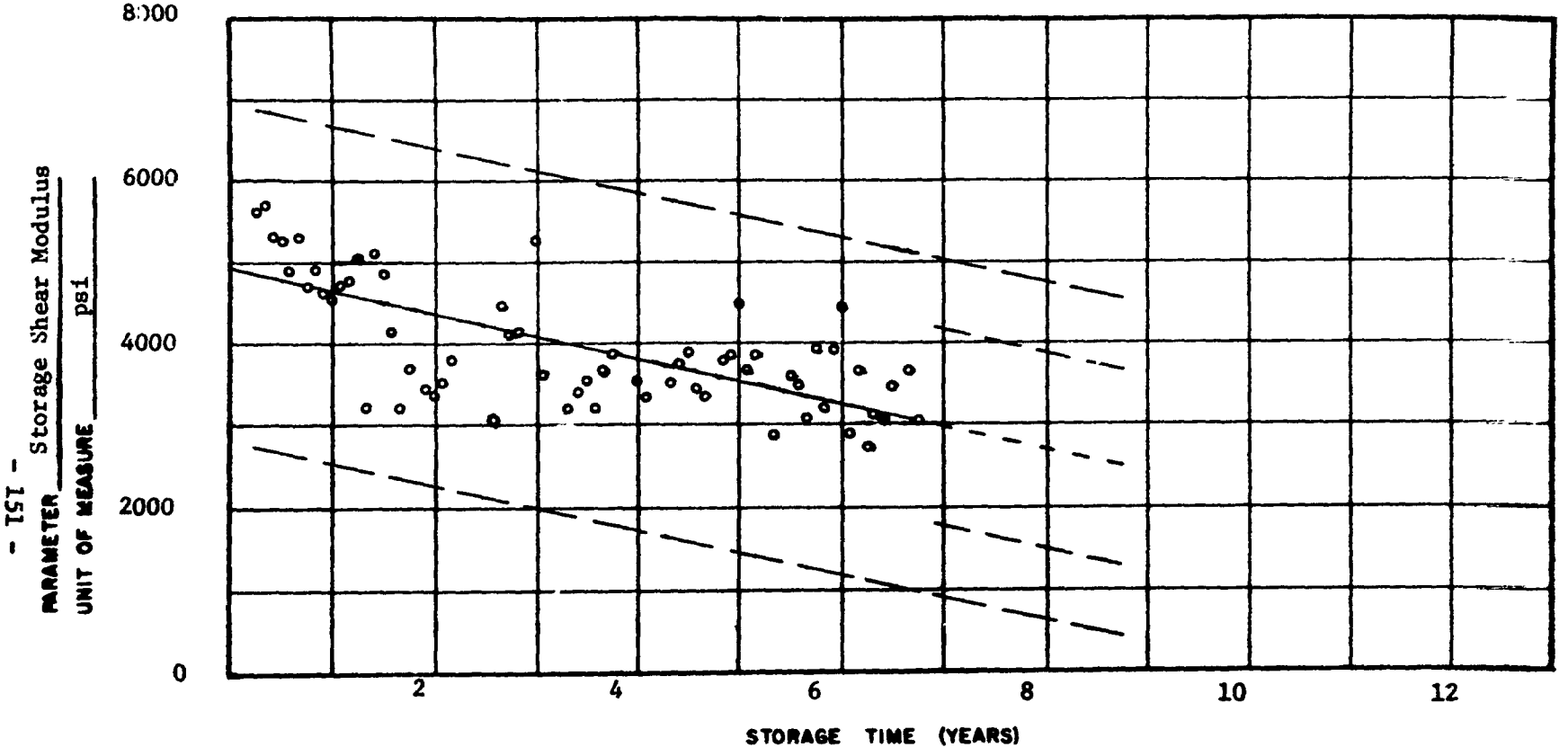
STAGE 1 WING 6, TP-H 1011 DYNAMIC RESPONSE, LOSS TANGENT, 200 HZ, 70 GM. CT. WT

Figure 69

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
3.0	3	23.0	6	53.0	7	75.0	2
4.0	7	24.0	5	54.0	2	76.0	7
5.0	4	25.0	4	55.0	4	77.0	3
6.0	4	26.0	2	56.0	2	78.0	2
7.0	6	31.0	2	58.0	4	80.0	2
8.0	3	32.0	5	59.0	2	81.0	2
9.0	13	33.0	9	60.0	2		308
10.0	18	34.0	5	61.0	6		
11.0	21	36.0	1	62.0	2		
12.0	16	42.0	3	64.0	2		
13.0	11	37.0	2	66.0	4		
14.0	16	40.0	6	67.0	2		
15.0	6	41.0	2	68.0	4		
16.0	5	43.0	2	69.0	4		
17.0	2	44.0	5	70.0	8		
18.0	7	45.0	1	71.0	6		
19.0	1	48.0	2	72.0	2		
20.0	4	49.0	4	73.0	4		
21.0	3	52.0	3	74.0	4		

Stage 1 Wing 6, TP-H 1011, Dynamic Response, Storage Shear Modulus, 500 Hz 70 Gram Center Weight



——— – – – —REGRESSION LINE
——— – – – ———90-90 TOLERANCE BAND
——— ——— ———3 SIGMA BAND
FAILURE CRITERIA
RANGE OF DATA
o MEAN VALUE OF DATA:
OOAMA MEAN

APPROVED, DAPF, JULY 70, LD.

REG EQ Y = 4913.91 - 22.9207 (x)
F RATIO 206.7494
DEG OF FREEDOM 1 and 306
SIG OF F Significant
STD DEV OF y (σy) 887.34
n 308
SPEC CONFIG 3.3" x 0.33" disc

CORRELATION -0.6350
SIG OF CORRELATION Significant
STD ERROR OF y ($S_{y \cdot x}$) 686.61
STD ERROR OF REG COEFF 1.594
CALC "t", SLOPE 14.3788
"t" REQ'D FOR SIG at 95% 1.962
STORAGE COND Ambient Temp/RH
TEST COND Ambient Temp/RH

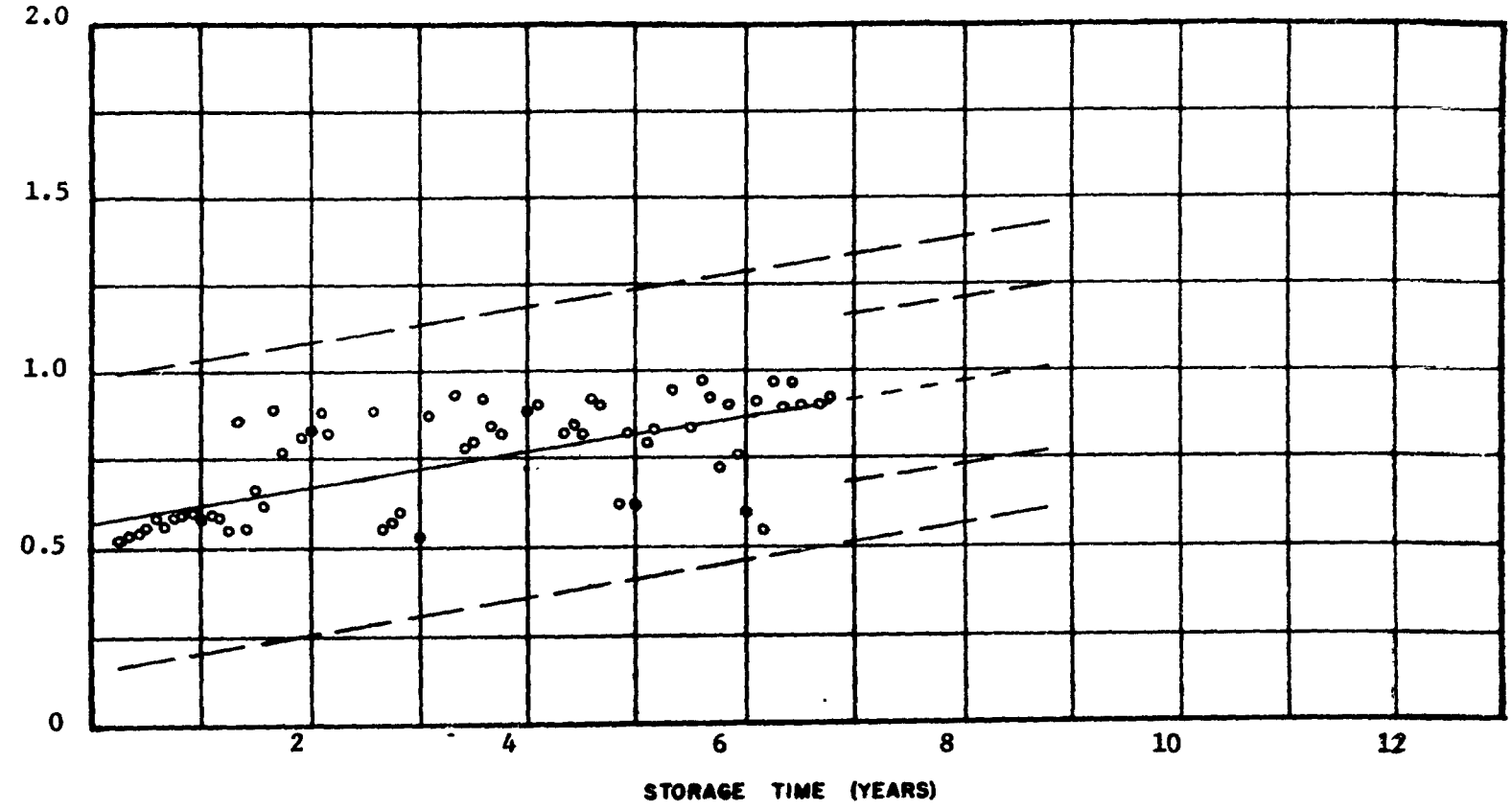
Stage 1 Wing 6, TP-H 1011, Dynamic Response, Storage Shear Modulus, 500 Hz
70 Gram Center Weight

Figure 70

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
3.0	3	24.0	5	55.0	4	78.0	2
4.0	7	25.0	3	56.0	2	80.0	2
5.0	4	26.0	2	58.0	4	81.0	2
6.0	4	31.0	1	59.0	2		300
7.0	6	32.0	5	60.0	2		
8.0	3	33.0	8	61.0	6		
9.0	13	34.0	4	62.0	2		
10.0	18	36.0	1	64.0	2		
11.0	21	37.0	2	66.0	4		
12.0	16	40.0	6	67.0	2		
13.0	11	41.0	2	68.0	4		
14.0	16	42.0	3	69.0	4		
15.0	6	43.0	2	70.0	7		
16.0	5	44.0	5	71.0	5		
17.0	2	45.0	1	72.0	2		
18.0	7	48.0	2	73.0	3		
19.0	1	49.0	4	74.0	4		
20.0	4	52.0	3	75.0	2		
21.0	3	53.0	7	76.0	7		
23.0	6	54.0	2	77.0	2		

Stage 1 Wing 6, TP-H 1011, Dynamic Response, Loss Tangent, 500 Hz, 70 Gram Center Weight



PARAMETER Loss Tangent
UNIT OF MEASURE N/A

——— — — —REGRESSION LINE
— — — —90-90 TOLERANCE BAND
——— ———3 SIGMA BAND
FAILURE CRITERIA
RANGE OF DATA
o MEAN VALUE OF DATA:
OOAMA MEAN

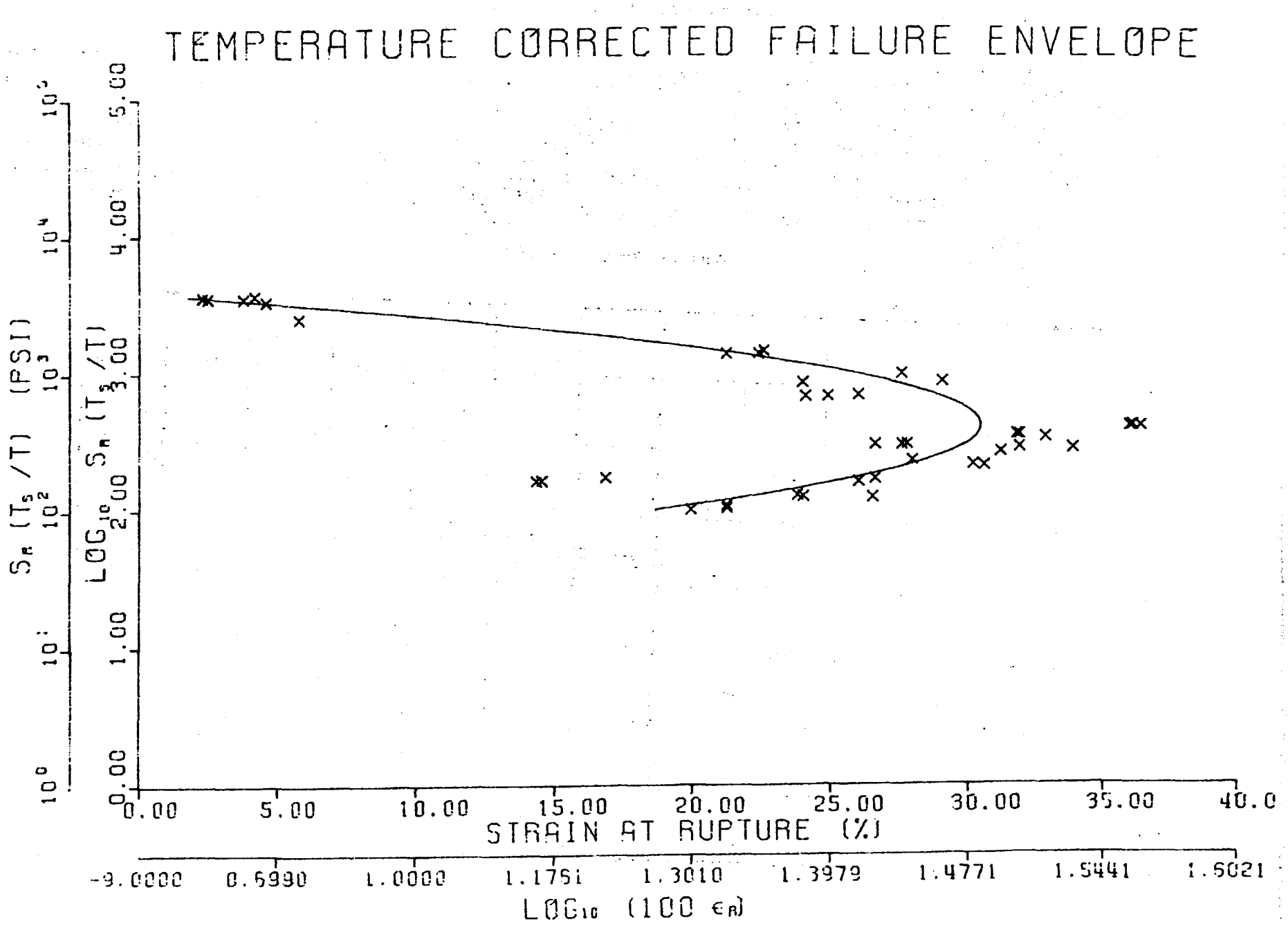
APPROVED, DAPF, JULY 70, LD.

REG EQ Y=0.5758 + 0.0042 (x)
F RATIO 173.2488
DEG OF FREEDOM 1 and 298
SIG OF F Significant
STD DEV OF y (σ_y) 0.1704
n 300
SPEC CONFIG 3.3" x 0.33" disc

CORRELATION +0.6063
SIG OF CORRELATION Significant
STD ERROR OF y ($S_{y.x}$) 0.1357
STD ERROR OF REG COEFF 0.0003
CALC "t", SLOPE 13.1623
"t" REQ'D FOR SIG at 95% 1.982
STORAGE COND Ambient Temp/RH
TEST COND Ambient Temp/RH

Stage 1 Wing 6, TP-H 1011, Dynamic Response, Loss Tangent, 500 Hz, 70 Gram Center Weight

Figure 71



Stage 1 Wing 6, TP-H 1011, Failure Envelope
Figure 72

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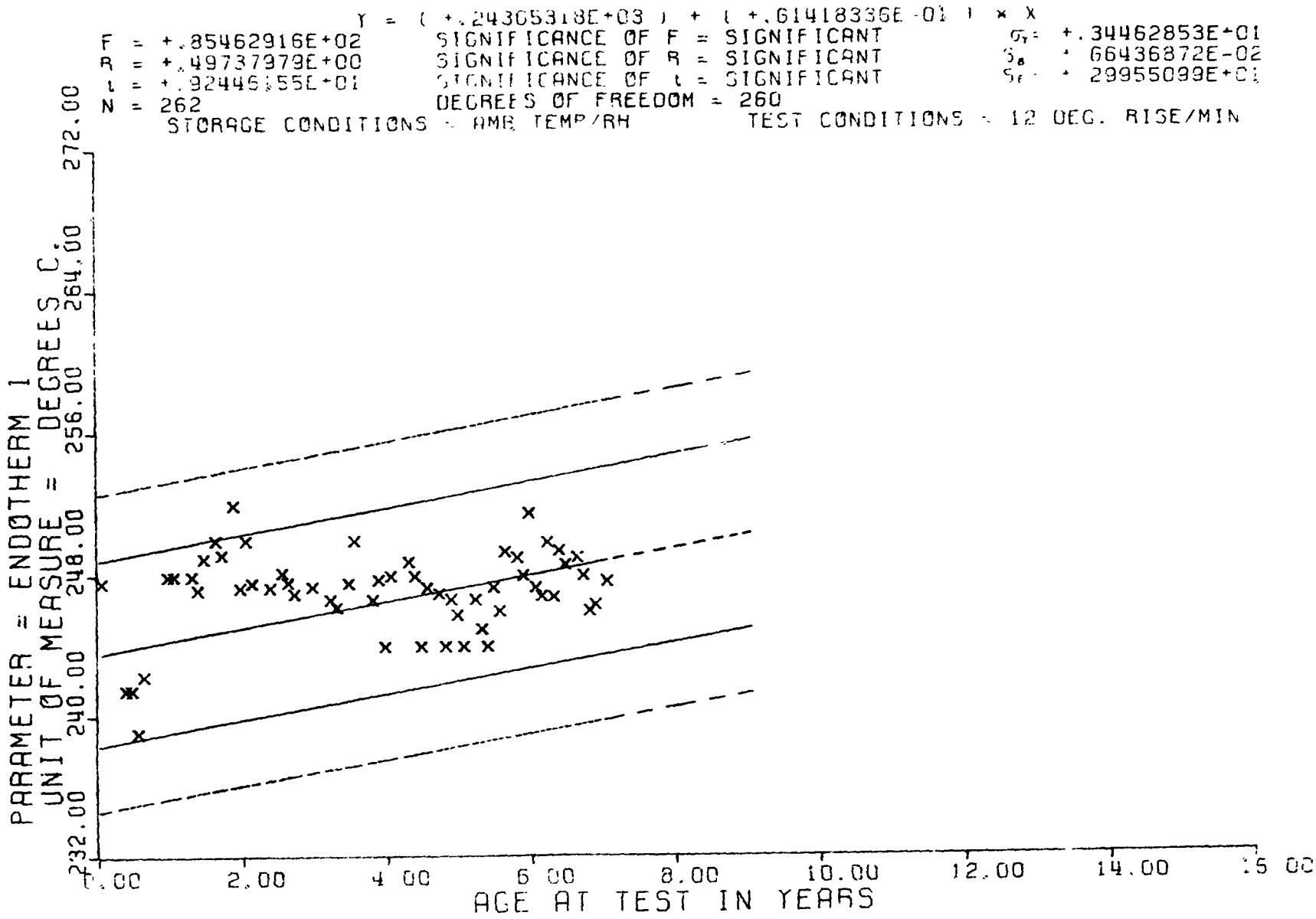
SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
1.0	3	33.0	2	63.0	3	85 0	6
5.0	9	36.0	5	64.0	2		262
6.0	27	39.0	3	65.0	2		
7.0	11	40.0	4	66.0	3		
8.0	9	42.0	5	67.0	5		
12.0	3	43.0	2	68.0	3		
13.0	3	46.0	3	70.0	7		
16.0	5	47.0	5	71.0	5		
17.0	9	48.0	3	72.0	2		
18.0	2	49.0	5	73.0	3		
20.0	2	52.0	5	74.0	6		
21.0	5	53.0	1	75.0	9		
23.0	2	54.0	2	76.0	5		
24.0	3	55.0	3	77.0	5		
25.0	2	57.0	3	78.0	5		
26.0	5	58.0	2	80.0	3		
29.0	3	59.0	3	81.0	5		
31.0	5	60.0	5	82.0	3		
32.0	3	61.0	2	83.0	6		

Stage 1 Wing 6, TP-H 1011, DTA, Endotherm 1, 12 Degree Centigrade Rise/Min



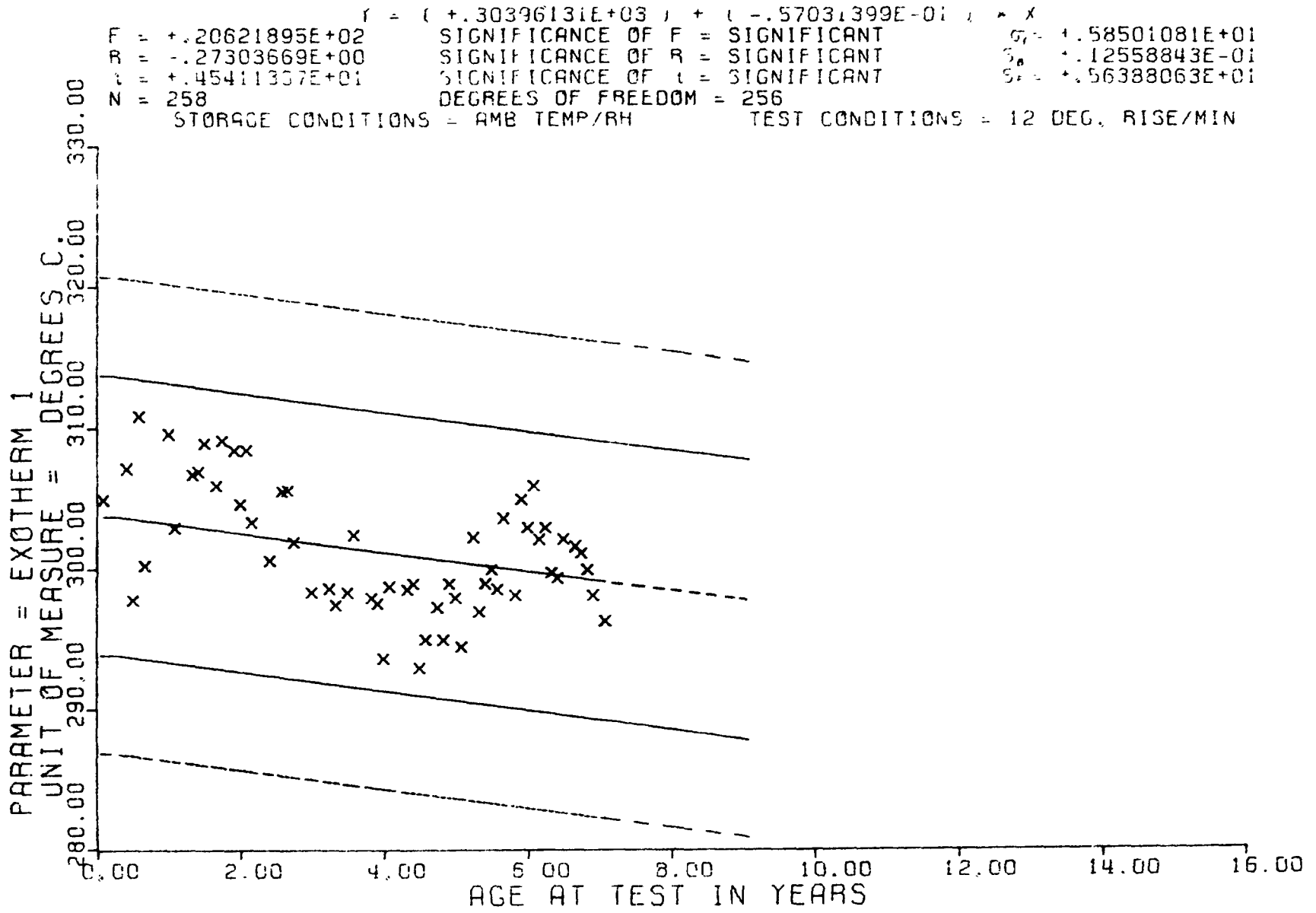
STAGE 1 WING 5, TP-H 1011, DTA, ENDOTHERM 1, 12 DEGREE CENTIGRADE RISE/MIN.

Figure 73

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
1.0	3	33.0	2	63.0	3	85.0	6
5.0	9	36.0	5	64.0	1		258
6.0	27	39.0	3	65.0	2		
7.0	11	40.0	4	66.0	3		
8.0	9	42.0	5	67.0	5		
12.0	3	43.0	2	68.0	3		
13.0	3	46.0	3	70.0	6		
16.0	5	47.0	5	71.0	5		
17.0	9	48.0	3	72.0	2		
18.0	2	49.0	5	73.0	3		
20.0	2	52.0	5	74.0	6		
21.0	5	53.0	1	75.0	9		
23.0	2	54.0	1	76.0	5		
24.0	3	55.0	3	77.0	5		
25.0	2	57.0	3	78.0	5		
26.0	5	58.0	2	80.0	3		
29.0	3	59.0	3	81.0	5		
31.0	5	60.0	4	82.0	3		
32.0	3	61.0	2	83.0	6		

Stage 1 Wing 6, TP-H 1011, DTA, Exotherm 1, 12 Degree Centigrade Rise/Min



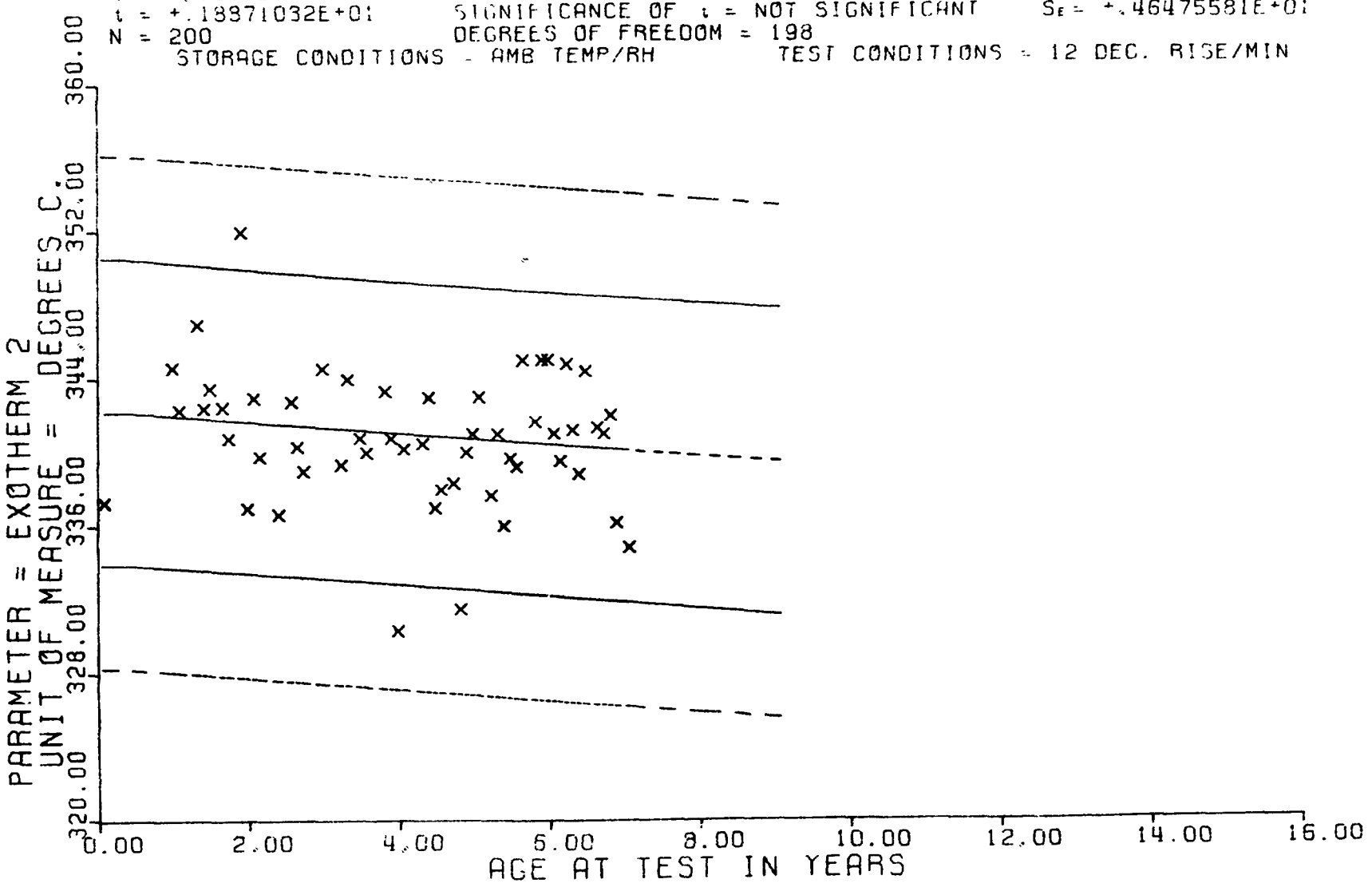
STAGE 1 WING 0. TP-H 1011 DTA, EXOTHERM 1, 12 DEGREE CENTIGRADE RISE/MIN.

Figure 74

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
1.0	3	42.0	5	67.0	5
12.0	3	43.0	2	68.0	3
13.0	3	46.0	3	70.0	6
16.0	5	47.0	5	71.0	5
17.0	9	48.0	3	72.0	2
18.0	2	49.0	5	73.0	3
20.0	2	52.0	4	74.0	6
21.0	5	53.0	1	75.0	9
23.0	2	54.0	1	76.0	5
24.0	3	55.0	3	77.0	5
25.0	2	57.0	3	78.0	5
26.0	5	58.0	2	80.0	3
29.0	3	59.0	3	81.0	5
31.0	5	60.0	4	82.0	3
32.0	3	61.0	2	83.0	6
33.0	2	63.0	3	85.0	5
36.0	5	64.0	1		200
39.0	3	65.0	2		
40.0	4	66.0	3		

Stage 1 Wing 6, TP-H 1011, DTA, Exotherm 2, 12 Degree Centigrade Rise/Min



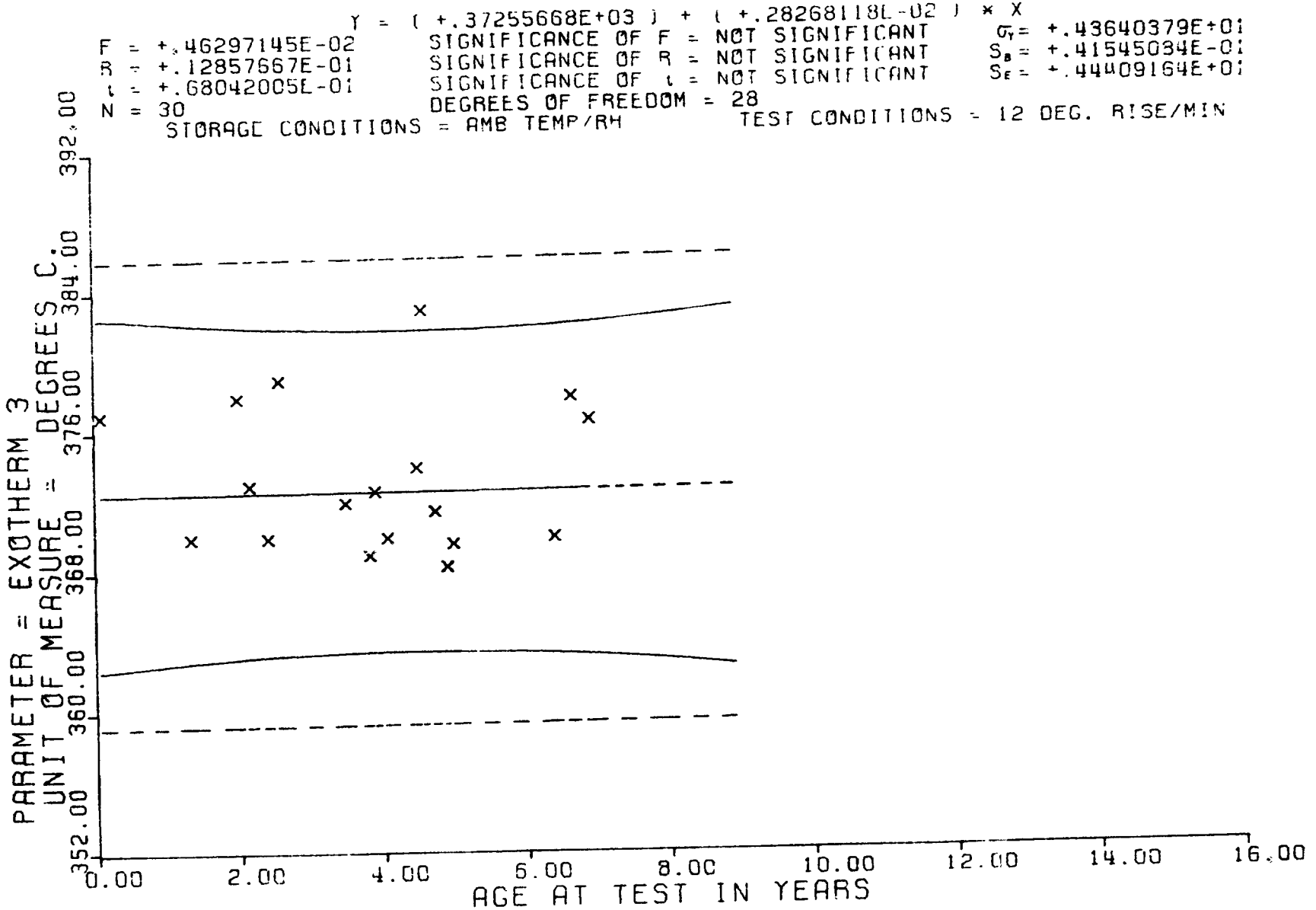
STAGE 1 WING 6, TP-H 1011, DTA, EXOTHERM 2, 12 DEGREE CENTIGRADE RISE/MIN.

Figure 75

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples
1.0	1	49.0	1
16.0	1	54.0	1
24.0	1	55.0	1
26.0	1	57.0	2
29.0	1	59.0	3
31.0	1	60.0	3
42.0	3	77.0	1
46.0	2	80.0	1
47.0	3	83.0	3
			30

Stage 1 Wing 6, TP-H 1011, DTA Exotherm 3, 12 Degree Centigrade Rise/Min



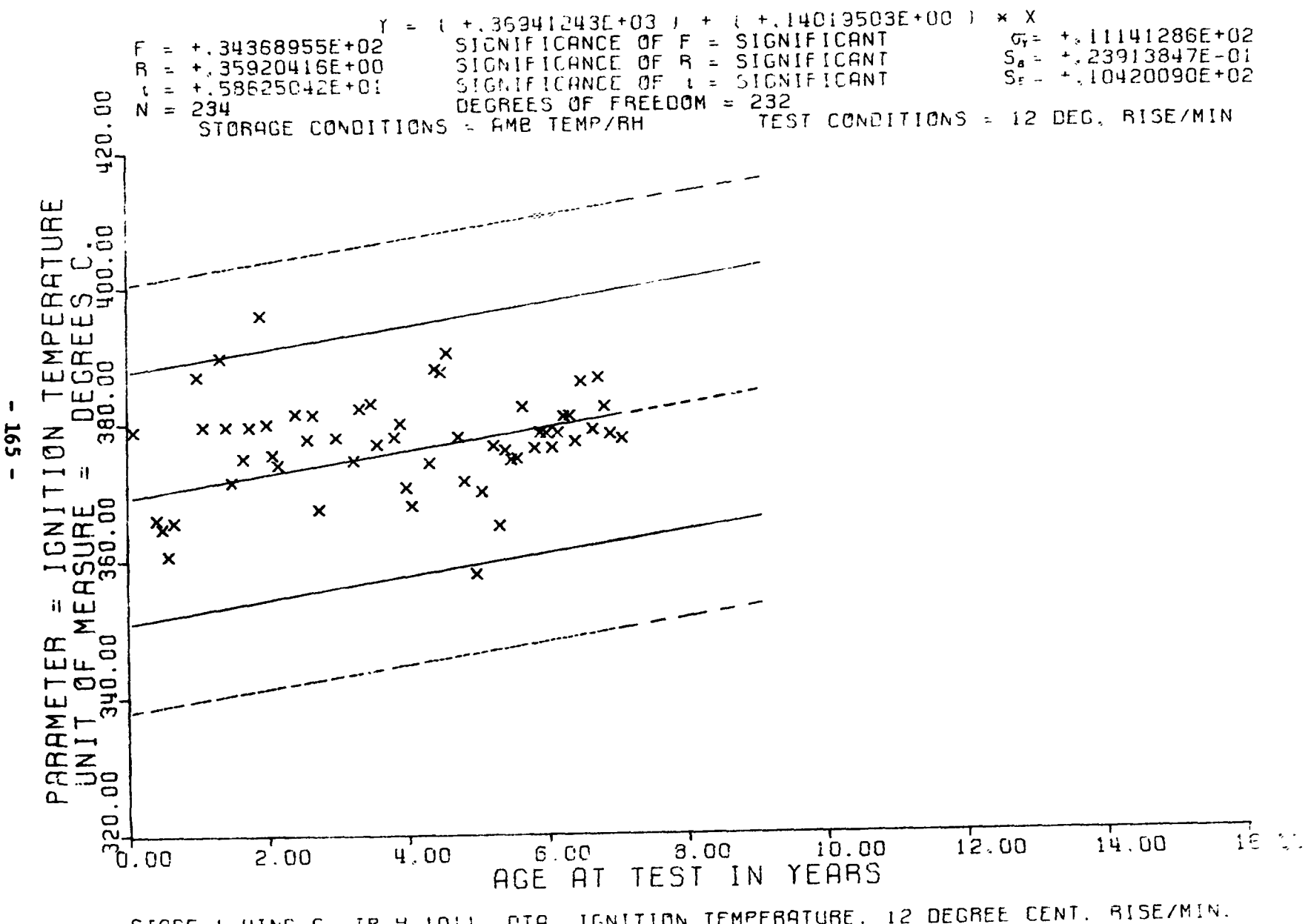
STAGE 1 WING G, TP-H 1011, DTA, EXOTHERM 3, 12 DEGREE CENTIGRADE RISE/MIN.

Figure 76

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
1.0	2	36.0	5	66.0	3
5.0	9	39.0	3	67.0	5
6.0	27	40.0	4	68.0	3
7.0	11	42.0	2	70.0	7
8.0	9	43.0	2	71.0	5
12.0	3	46.0	1	72.0	2
13.0	3	47.0	2	73.0	3
16.0	4	48.0	3	74.0	6
17.0	9	49.0	4	75.0	9
18.0	2	52.0	5	76.0	5
20.0	2	53.0	1	77.0	4
21.0	5	54.0	2	78.0	5
23.0	2	55.0	3	80.0	2
24.0	2	57.0	1	81.0	5
25.0	2	58.0	2	82.0	3
26.0	4	60.0	2	83.0	3
29.0	2	61.0	2	85.0	6
31.0	4	63.0	3		234
32.0	3	64.0	2		
33.0	2	65.0	2		

Stage 1 Wing 6, TP-H 1011, DTA, Ignition Temperature, 12 Degree Cent Rise/Min



STAGE 1 WING G, TP-H 1011. DTA, IGNITION TEMPERATURE, 12 DEGREE CENT. RISE/MIN.

Figure 77

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
8.0	11	32.0	2	56.0	1	76.0	3
9.0	12	34.0	1	57.0	1	77.0	4
10.0	6	36.0	2	58.0	1	78.0	2
12.0	1	37.0	2	59.0	1	79.0	2
13.0	1	38.0	1	60.0	1	81.0	2
14.0	2	39.0	1	61.0	3	82.0	1
16.0	3	40.0	3	62.0	2	83.0	2
17.0	1	41.0	1	63.0	1	84.0	1
18.0	3	43.0	2	64.0	2	85.0	1
19.0	2	44.0	1	65.0	2	86.0	1
21.0	3	45.0	1	66.0	3	87.0	1
22.0	2	47.0	1	67.0	2		149
24.0	1	48.0	1	68.0	2		
25.0	1	49.0	5	69.0	3		
26.0	2	50.0	3	71.0	4		
27.0	1	52.0	2	72.0	5		
28.0	1	53.0	2	73.0	2		
30.0	2	54.0	1	74.0	1		
31.0	1	55.0	2	75.0	2		

Stage 1 Wing 6 TP-H 1011 Heat of Explosion

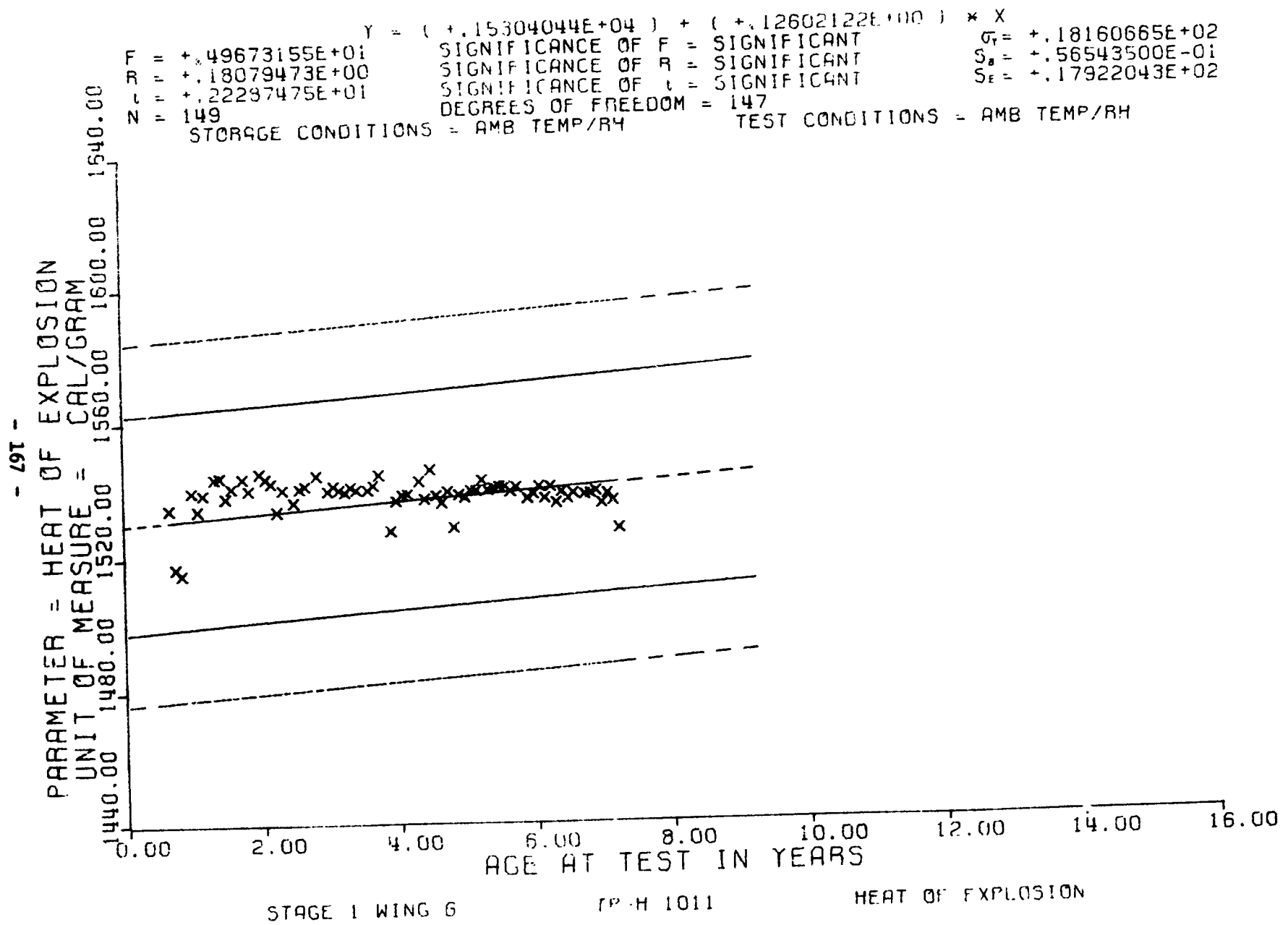

Y = (+.15304044E+04) + (+.12602122E+00) * X
F = +.49673155E+01
R = +.18079473E+00
t = +.22287475E+01
N = 149
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF t = SIGNIFICANT
DEGREES OF FREEDOM = 147
σY = +.18160665E+02
Sa = +.56543500E-01
SE = +.17922043E+02
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = HEAT OF EXPLOSION
UNIT OF MEASURE = CAL/GRAM
1540.00
1560.00
1580.00
1600.00
1520.00
1500.00
1480.00
1460.00
1440.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST IN YEARS
STAGE I WING 6
TP-H 1011
HEAT OF EXPLOSION

Figure 78

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
11.0	1	40.0	2	64.0	2
14.0	1	41.0	1	66.0	3
15.0	1	43.0	1	67.0	2
16.0	2	44.0	1	68.0	2
18.0	1	45.0	1	69.0	1
19.0	1	47.0	1	70.0	2
20.0	2	48.0	1	71.0	2
21.0	1	49.0	3	72.0	3
22.0	1	50.0	1	73.0	2
24.0	1	51.0	2	74.0	1
25.0	1	53.0	2	76.0	2
26.0	1	54.0	1	77.0	2
29.0	1	55.0	1	78.0	1
31.0	1	57.0	1	79.0	1
33.0	1	58.0	1	81.0	1
36.0	4	60.0	1	82.0	1
37.0	1	61.0	1		79
38.0	2	62.0	2		
39.0	1	63.0	2		

Stage 1 Wing 6 TP-H 1011 Maximum Pressure Pressure Time

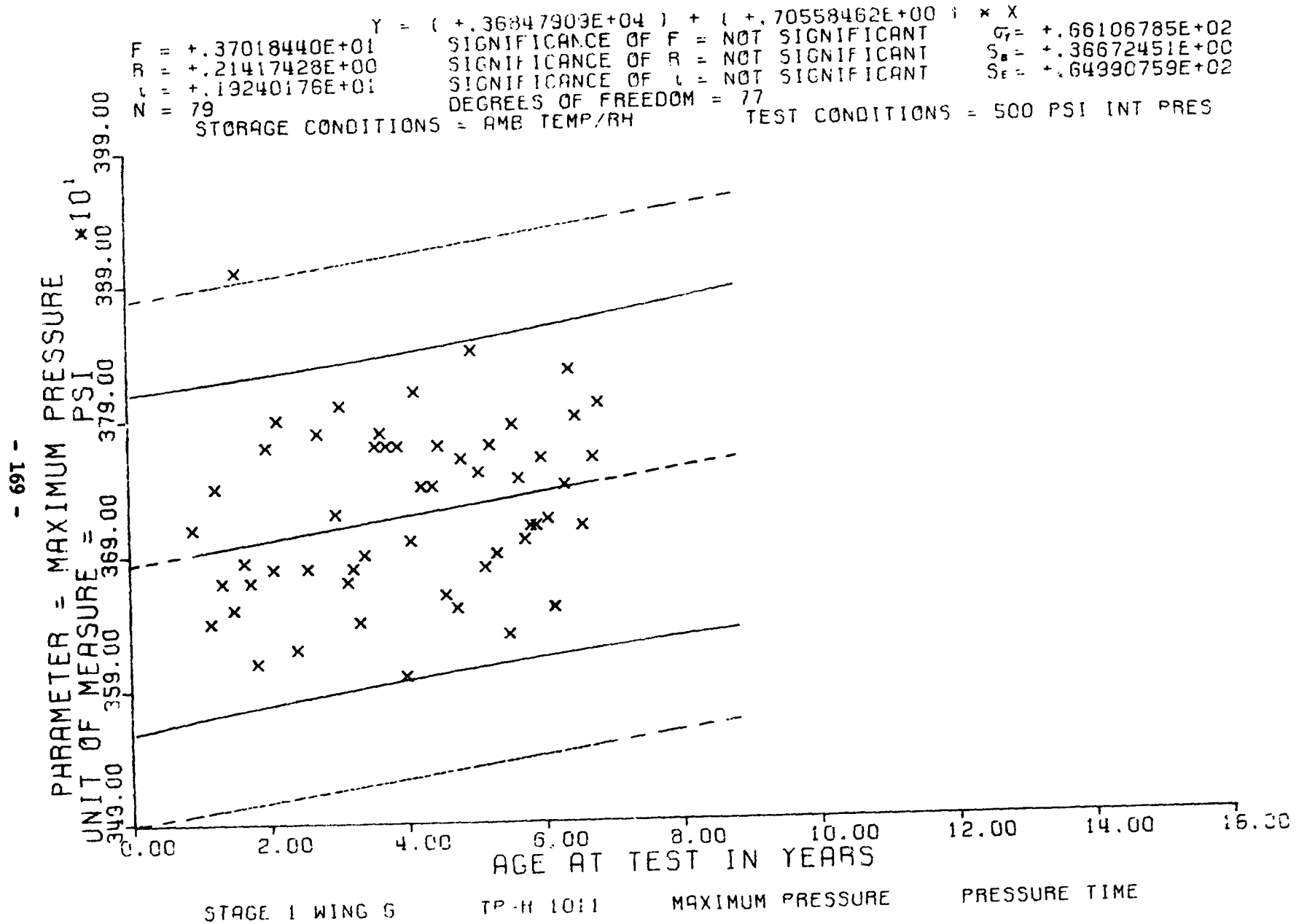

Y = (+.36847903E+04) + (+.70558462E+00) * X
F = +.37018440E+01
R = +.21417428E+00
t = +.19240176E+01
N = 79
SIGNIFICANCE OF F = NOT SIGNIFICANT
SIGNIFICANCE OF R = NOT SIGNIFICANT
SIGNIFICANCE OF t = NOT SIGNIFICANT
DEGREES OF FREEDOM = 77
σY = +.66106785E+02
Sa = +.36672451E+00
SE = +.64990759E+02
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = 500 PSI INT PRES
PARAMETER = MAXIMUM PRESSURE
UNIT OF MEASURE = PSI
×10¹
399.00
389.00
379.00
369.00
359.00
349.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST IN YEARS
STAGE 1 WING 6
TP-H 1011
MAXIMUM PRESSURE
PRESSURE TIME

Figure 79

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
11.0	1	40.0	2	64.0	2
14.0	1	41.0	1	66.0	3
15.0	1	43.0	1	67.0	2
16.0	2	44.0	1	68.0	2
18.0	1	45.0	1	69.0	1
19.0	1	47.0	1	70.0	2
20.0	2	48.0	1	71.0	2
21.0	1	49.0	3	72.0	3
22.0	1	50.0	1	73.0	2
24.0	1	51.0	2	74.0	1
25.0	1	53.0	2	76.0	2
26.0	1	54.0	1	77.0	2
29.0	1	55.0	1	78.0	1
31.0	1	57.0	1	79.0	1
33.0	1	58.0	1	81.0	1
36.0	4	60.0	1	82.0	1
37.0	1	61.0	1		79
38.0	2	62.0	2		
39.0	1	63.0	2		

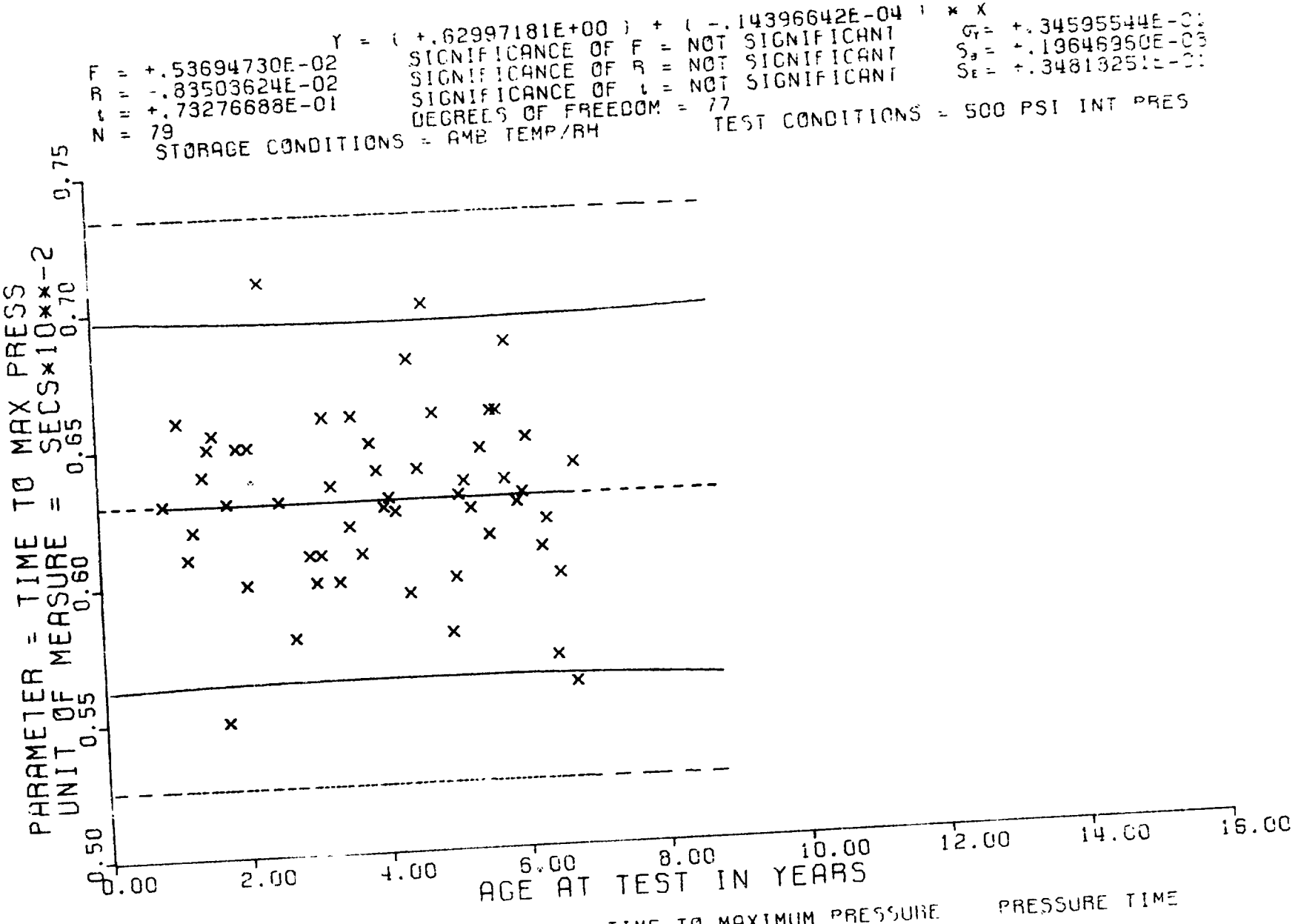

Y = (+.62997181E+00) + (-.14396642E-04) * X
F = +.53694730E-02
R = -.83503624E-02
t = +.73276688E-01
N = 79
SIGNIFICANCE OF F = NOT SIGNIFICANT
SIGNIFICANCE OF R = NOT SIGNIFICANT
SIGNIFICANCE OF t = NOT SIGNIFICANT
DEGREES OF FREEDOM = 77
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = 500 PSI INT PRES
PARAMETER = TIME TO MAX PRESS
UNIT OF MEASURE = SECS*10**-2
0.75
0.70
0.65
0.60
0.55
0.50
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST IN YEARS
STAGE 1 WINC 6
TP-H 1011
TIME TO MAXIMUM PRESSURE
PRESSURE TIME

Figure 80

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
5.0	18	33.0	3	61.0	9
6.0	54	34.0	6	62.0	3
7.0	24	36.0	3	63.0	3
8.0	18	37.0	4	64.0	9
10.0	3	38.0	3	65.0	6
12.0	3	40.0	6	67.0	3
14.0	3	42.0	3	68.0	9
15.0	3	43.0	6	70.0	15
16.0	3	46.0	3	71.0	6
17.0	3	47.0	9	72.0	3
18.0	6	49.0	6	73.0	3
19.0	3	50.0	6	75.0	6
20.0	3	52.0	3	76.0	6
21.0	3	53.0	6	77.0	3
23.0	3	54.0	3	78.0	3
25.0	3	55.0	3	80.0	3
26.0	3	58.0	3	81.0	3
28.0	3	59.0	3		337
31.0	3	60.0	3		

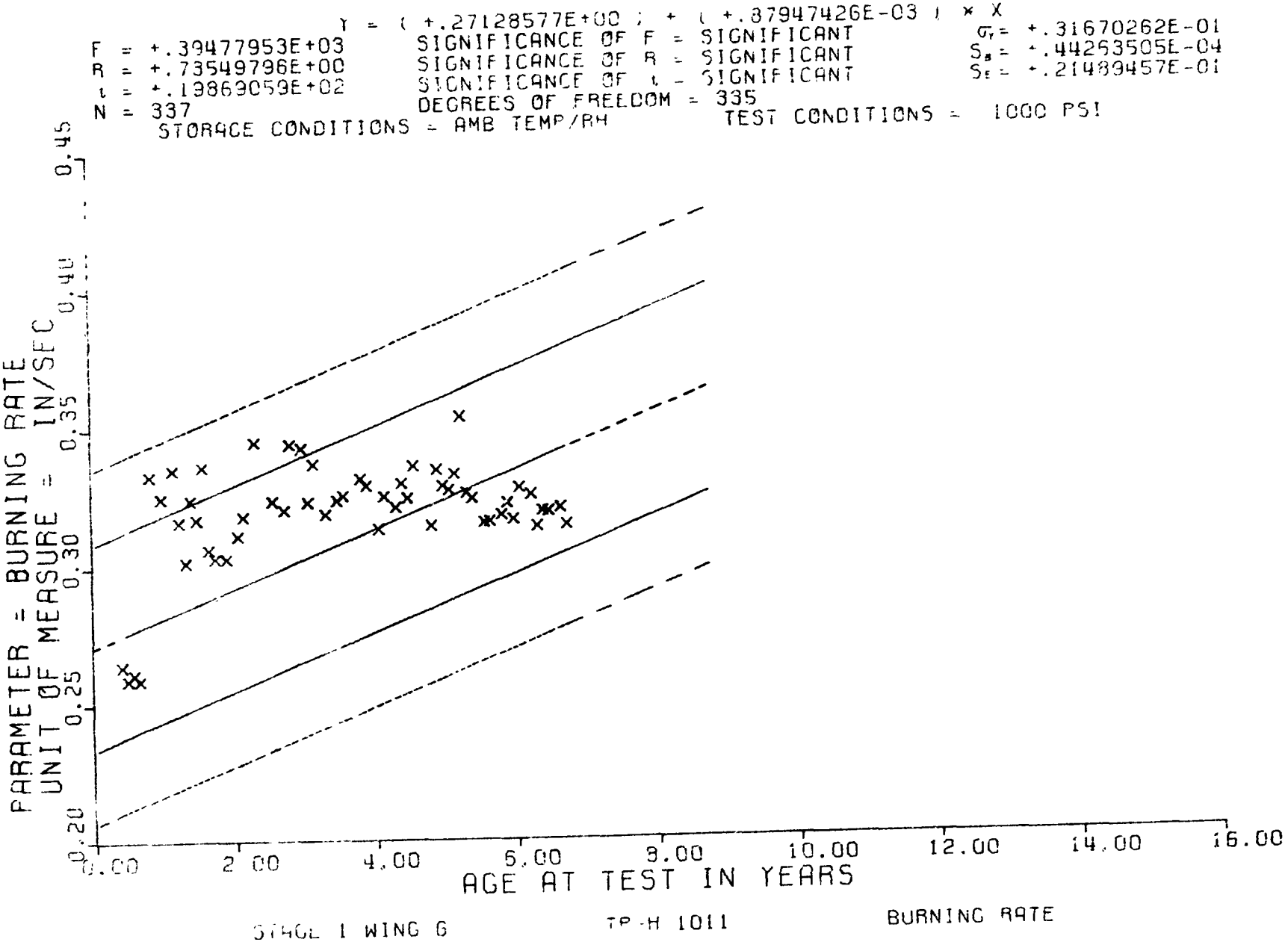
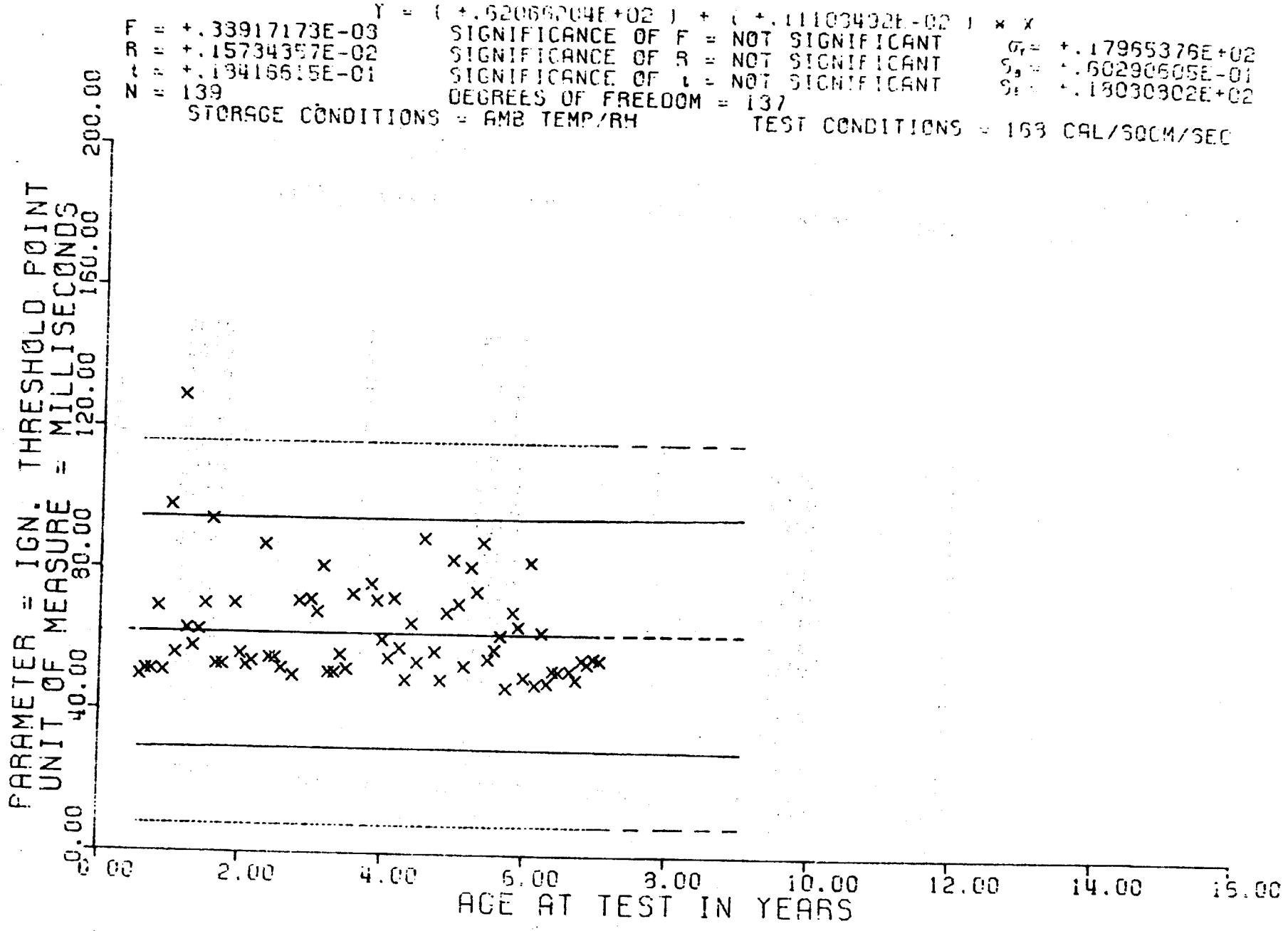

Y = (+.27128577E+00) + (+.87947426E-03) × X
F = +.39477953E+03
R = +.73549796E+00
t = +.19869059E+02
N = 337
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF t = SIGNIFICANT
DEGREES OF FREEDOM = 335
σy = +.31670262E-01
Sa = +.44263505E-04
Sb = +.21489457E-01
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = 1000 PSI
PARAMETER = BURNING RATE
UNIT OF MEASURE = IN/SEC
0.45
0.40
0.35
0.30
0.25
0.20
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST IN YEARS
STAGE I WING G
TP-H 1011
BURNING RATE

Figure 81

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
7.0	7	28.0	1	51.0	1	71.0	3
8.0	6	29.0	1	52.0	1	72.0	2
9.0	3	30.0	1	53.0	2	73.0	2
10.0	5	31.0	2	54.0	2	74.0	1
11.0	1	33.0	1	55.0	1	75.0	3
12.0	1	34.0	2	57.0	1	76.0	2
13.0	2	36.0	2	58.0	1	77.0	2
14.0	1	37.0	1	59.0	2	78.0	3
15.0	3	38.0	1	60.0	2	80.0	2
16.0	1	39.0	1	61.0	2	81.0	2
17.0	3	40.0	1	62.0	1	82.0	1
18.0	2	41.0	1	63.0	1	83.0	1
19.0	1	42.0	1	64.0	3	84.0	2
20.0	2	43.0	2	65.0	2	85.0	1
21.0	1	46.0	1	66.0	1		139
23.0	4	47.0	3	67.0	3		
24.0	1	48.0	3	68.0	3		
25.0	3	49.0	2	69.0	1		
26.0	1	50.0	2	70.0	5		

Stage 1 Wing 6, TP-H 1011, Ignitability, IGN Threshold Point, 168 Cal/Sq Cm/Sec



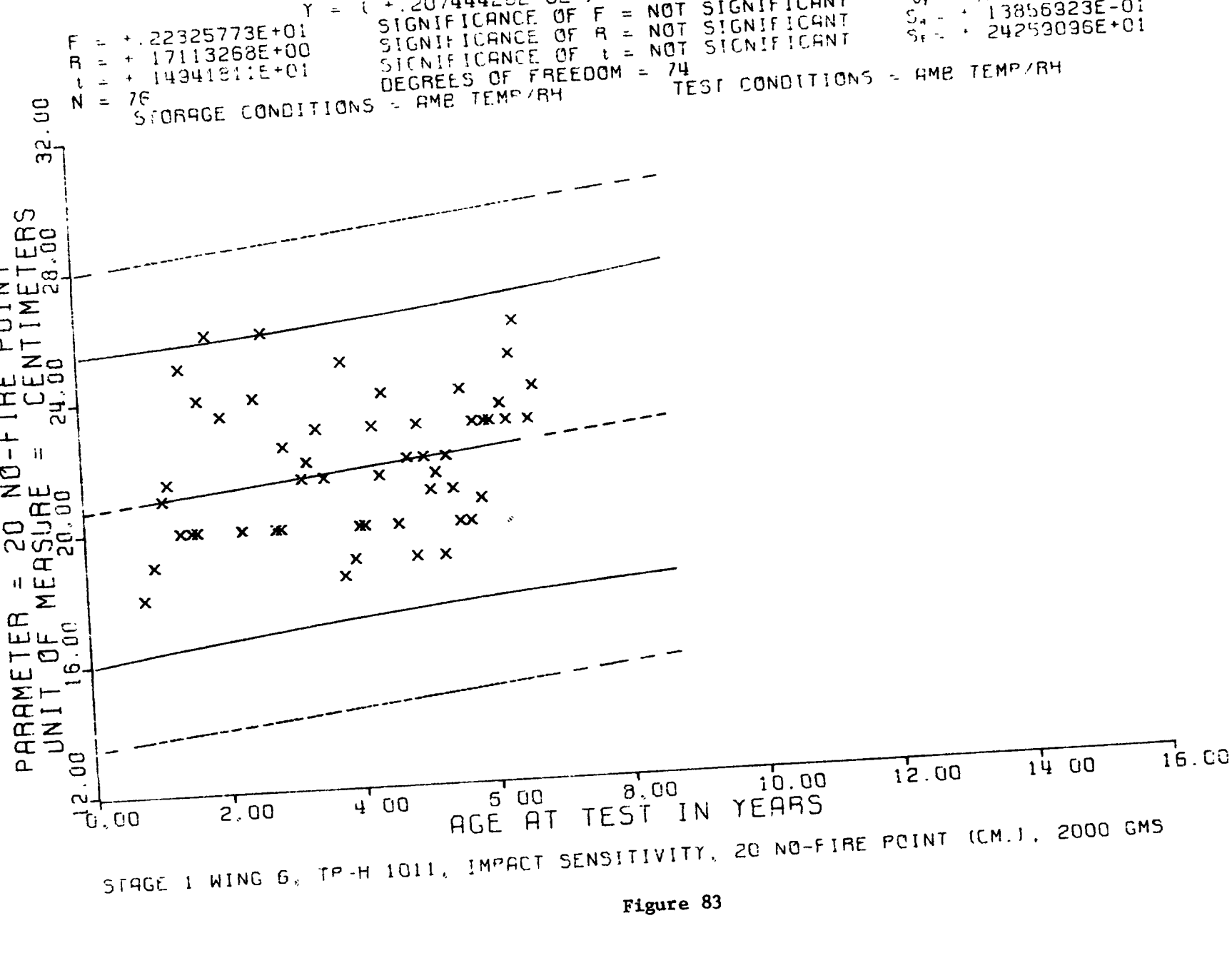
STAGE 1 WING S. TP-H 1011, IGNITABILITY, IGN THRESHOLD POINT, 163 CAL/SQ CM/SEC
= 1

Figure 82

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples
10.0	1
12.0	1
14.0	1
15.0	2
17.0	1
18.0	1
19.0	1
20.0	2
21.0	1
23.0	1
25.0	2
28.0	1
31.0	1
33.0	1
34.0	1
35.0	1
36.0	2
39.0	2
40.0	1
42.0	1
43.0	2
46.0	2
47.0	1
48.0	3
49.0	2
50.0	1
52.0	1
53.0	2
54.0	1
56.0	1
58.0	1
59.0	1
60.0	1
61.0	3
62.0	1
63.0	2
64.0	1
65.0	2
66.0	2
67.0	1
68.0	2
69.0	1
70.0	3
71.0	3
72.0	2
73.0	1
75.0	2
76.0	2
77.0	1
78.0	1
80.0	1
81.0	1
	76

Stage 1 Wing 6, TP-H 1011, Impact Sensitivity, 20 No-Fire Point (CM) 2000 GMS



STAGE 1 WING G, TP-H 1011, IMPACT SENSITIVITY, 20 NO-FIRE POINT (CM.), 2000 GMS

Figure 83

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
4.0	66	25.0	5	51.0	15	71.0	10
5.0	108	27.0	15	52.0	30	72.0	20
6.0	123	30.0	15	53.0	15	74.0	35
7.0	114	32.0	15	55.0	15	75.0	20
8.0	114	33.0	10	56.0	10	76.0	20
9.0	117	34.0	20	57.0	5	77.0	15
10.0	108	35.0	10	58.0	15	78.0	5
11.0	111	36.0	20	59.0	25	79.0	10
12.0	75	37.0	15	60.0	30	80.0	10
13.0	78	38.0	23	61.0	25	81.0	5
14.0	104	39.0	25	62.0	15		2,498
15.0	94	41.0	10	63.0	40		
16.0	78	42.0	25	64.0	25		
17.0	91	43.0	10	65.0	20		
18.0	83	45.0	15	66.0	25		
19.0	41	46.0	30	67.0	30		
20.0	15	47.0	30	68.0	30		
22.0	15	48.0	30	69.0	50		
24.0	25	49.0	15	70.0	30		

Stage 1 Wing 6 TP-H 1011 Shore A, 10 Second Hardness

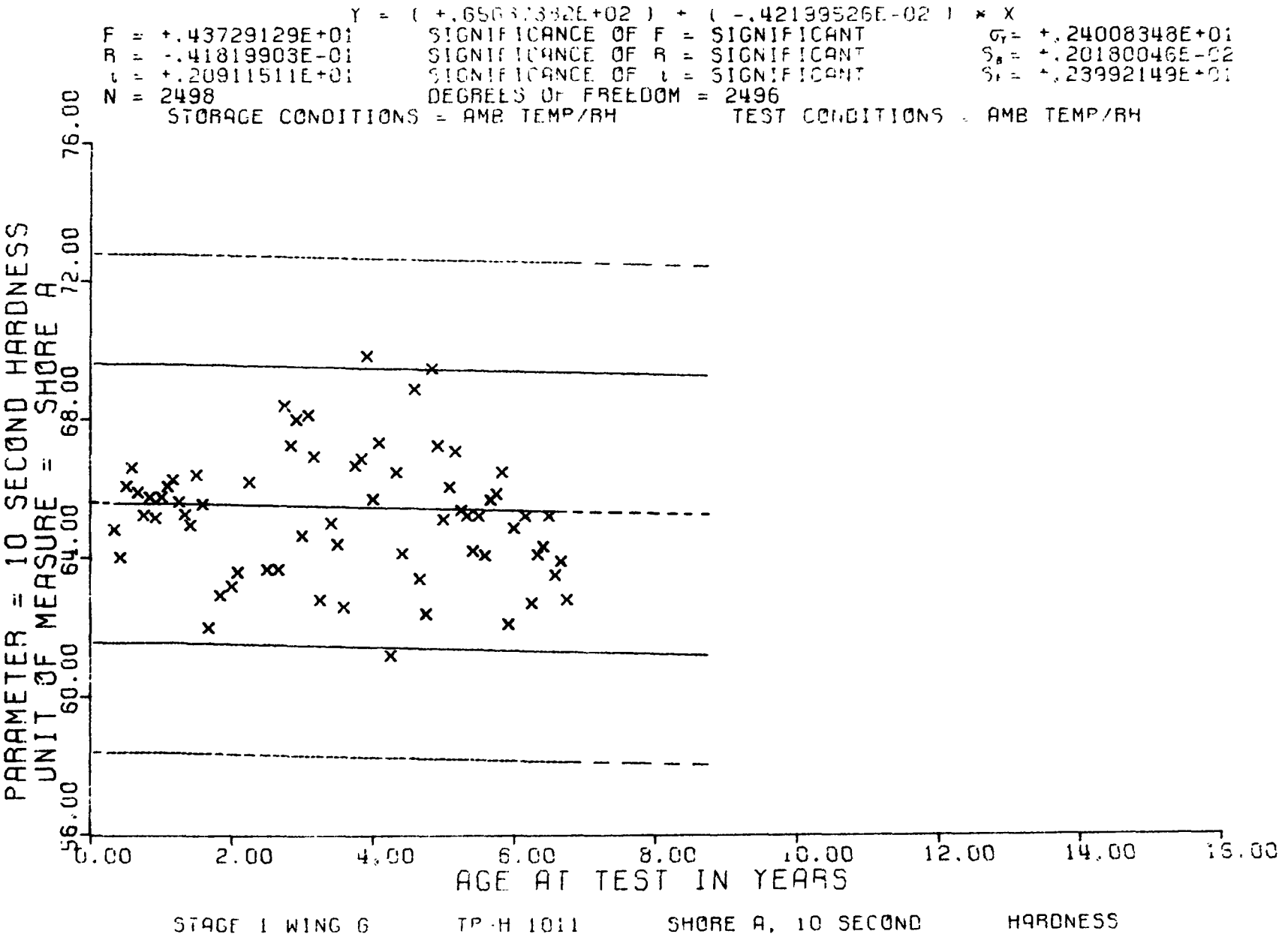
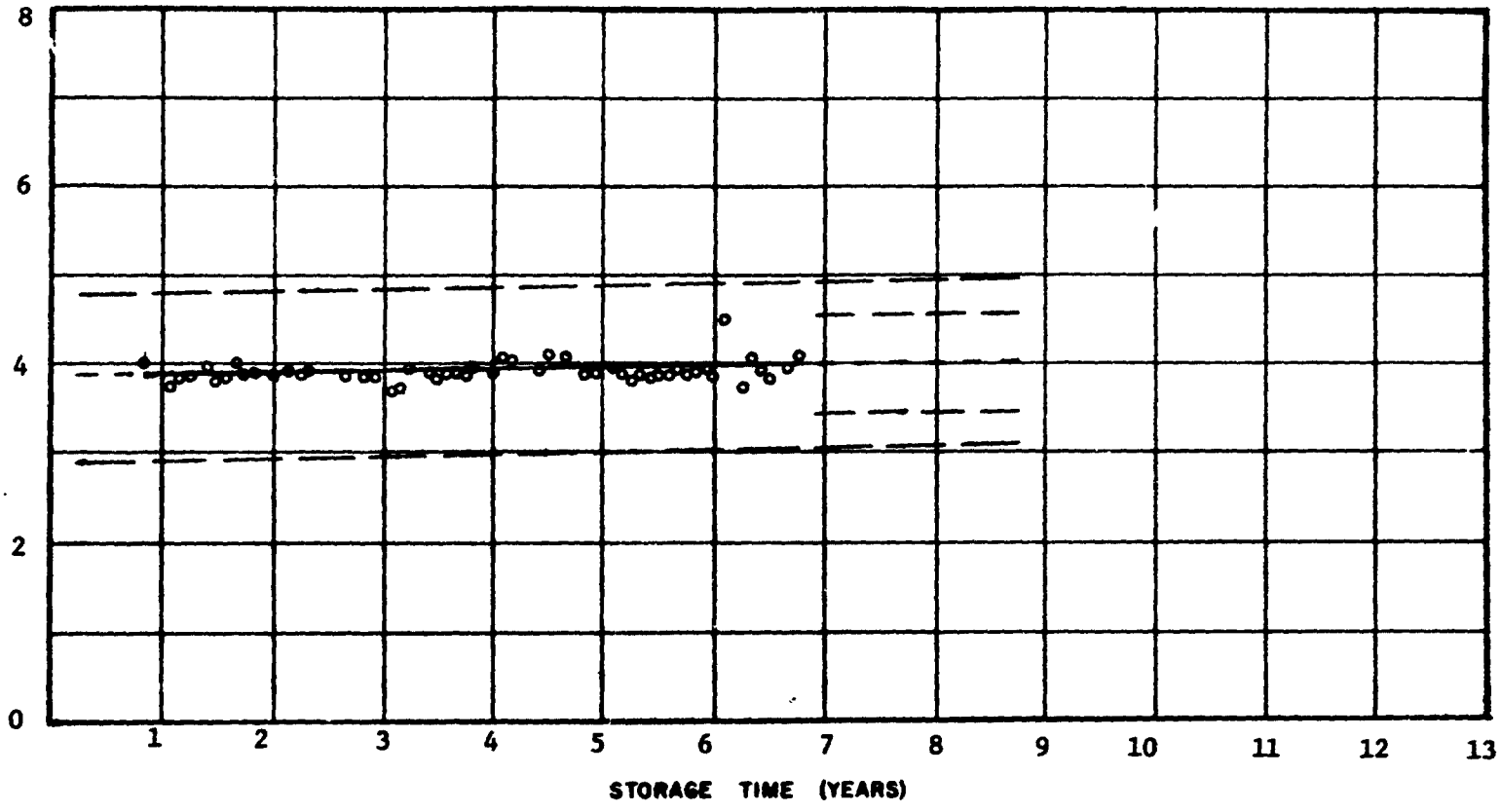

Y = (+.65633382E+02) + (-.42199526E-02) * X
F = +.43729129E+01
SIGNIFICANCE OF F = SIGNIFICANT
σr = +.24008348E+01
R = -.41819903E-01
SIGNIFICANCE OF R = SIGNIFICANT
Sb = +.20180046E-02
t = +.20911511E+01
SIGNIFICANCE OF t = SIGNIFICANT
Sr = +.23992149E+01
N = 2498
DEGREES OF FREEDOM = 2496
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = 10 SECOND HARDNESS
UNIT OF MEASURE = SHORE A
76.00
72.00
68.00
64.00
60.00
56.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST IN YEARS
STAGE I WING 6
TP-H 1011
SHORE A, 10 SECOND
HARDNESS

Figure 84

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
10.00	4	28.00	4	48.00	8	66.00	4
13.00	4	32.00	4	49.00	12	67.00	8
14.00	4	34.00	4	50.00	8	68.00	4
15.00	4	35.00	8	53.00	12	69.00	8
17.00	4	37.00	4	54.00	4	70.00	8
18.00	4	38.00	8	56.00	4	71.00	16
19.00	8	39.00	4	58.00	4	72.00	4
20.00	4	41.00	4	59.00	4	73.00	8
21.00	4	42.00	4	61.00	8	75.00	4
22.00	4	43.00	4	62.00	8	76.00	8
24.00	4	44.00	4	63.00	8	77.00	8
26.00	4	45.00	4	64.00	4	78.00	4
27.00	4	46.00	4	65.00	12	80.00	4
						81.00	4
							304

Stage I Wing 6, TP-H 1011, Sol Gel, Weight Swell Ratio



——— – – – —REGRESSION LINE
— — — —90-90 TOLERANCE BAND
——— ———3 SIGMA BAND
FAILURE CRITERIA
RANGE OF DATA
o MEAN VALUE OF DATA:
OOAMA MEAN

APPROVED, DAPF, JULY 70, LD.

REG EQ Y = 3.8415 + 0.0020 (X)
F RATIO 4.9099
DEG OF FREEDOM 1 and 302
SIG OF F Significant
STD DEV OF y (σy) 0.3105
n 304
SPEC CONFIG 1/2" x 1/2" x 1/2"

CORRELATION + 0.1265
SIG OF CORRELATION Significant
STD ERROR OF y ($S_{y.x}$) 0.3085
STD ERROR OF REG COEFF 0.0009
CALC "t", SLOPE 2.2158
"t" REQ'D FOR SIG at 95% 1.960
STORAGE COND Ambient
TEST COND 77°F, ambient RH

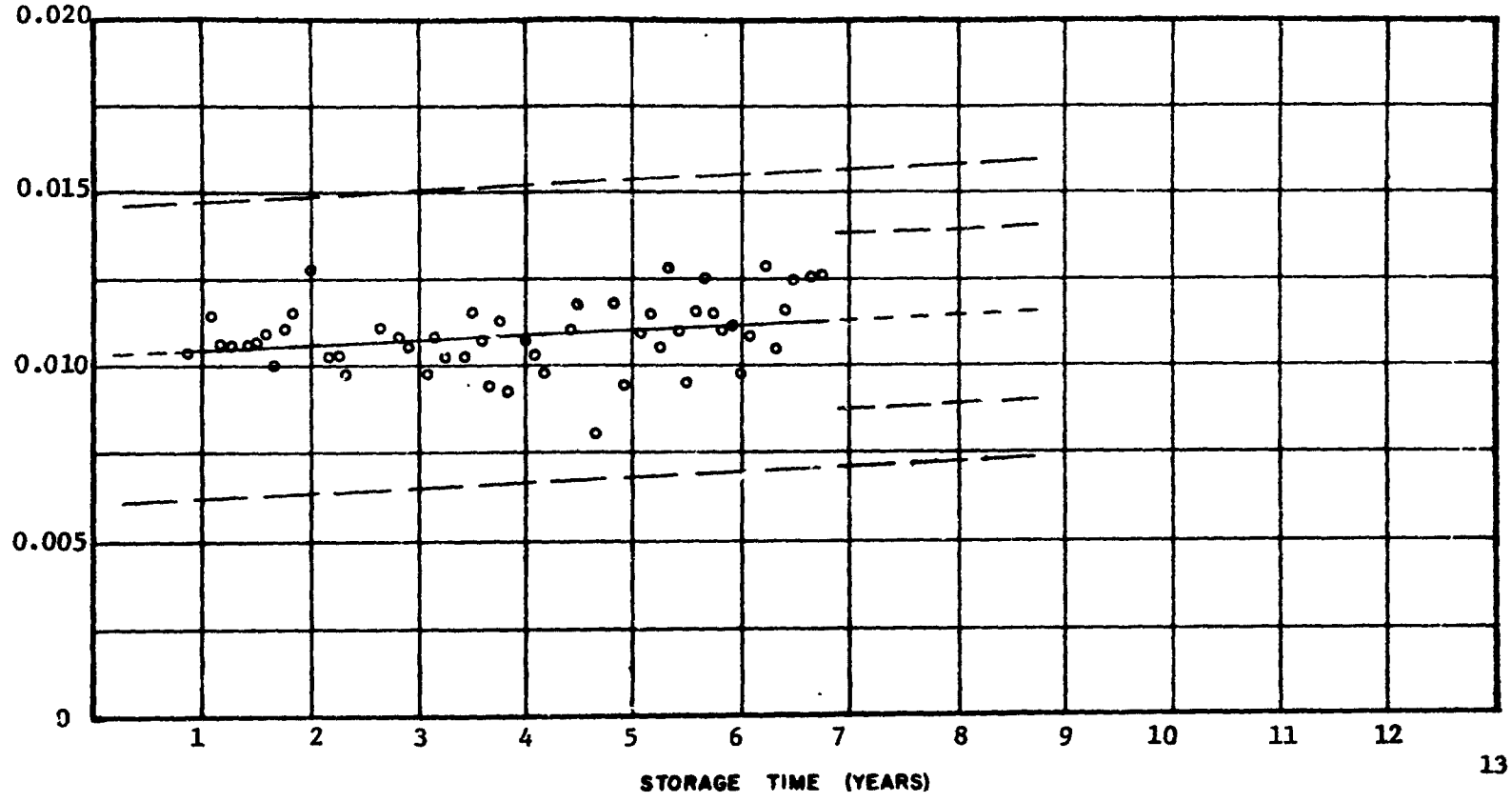
Stage I Wing 6, TP-H 1011, Sol Gel, Weight Swell Ratio

Figure 85

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
10.00	4	32.00	4	49.00	12	67.00	8
13.00	4	34.00	4	50.00	8	68.00	4
14.00	4	35.00	8	53.00	12	69.00	8
15.00	4	37.00	4	54.00	4	70.00	8
17.00	4	38.00	8	56.00	4	71.00	16
18.00	4	39.00	4	58.00	4	72.00	4
19.00	8	41.00	4	59.00	4	73.00	8
20.00	4	42.00	4	61.00	8	75.00	4
21.00	4	43.00	4	62.00	8	76.00	8
22.00	4	44.00	4	63.00	8	77.00	8
24.00	4	45.00	4	64.00	4	78.00	4
26.00	4	46.00	4	65.00	12	80.00	4
27.00	4	48.00	8	66.00	4	81.00	4
28.00	4						304

Stage I Wing 6, TP-H 1011, Sol Gel, Cross-Link Density



—— - - - —REGRESSION LINE
— — — —90-90 TOLERANCE BAND
—— —— —3 SIGMA BAND
FAILURE CRITERIA
RANGE OF DATA
o MEAN VALUE OF DATA:
OOAMA MEAN

APPROVED, DAPF, JULY 70, LD.

REG EQ Y = 0.010260+0.000012(X)
F RATIO 8.8788
DEG OF FREEDOM 1 and 302
SIG OF F Significant
STD DEV OF y (σy) 0.001440
n 304
SPEC CONFIG 1/2" x 1/2" x 1/2"

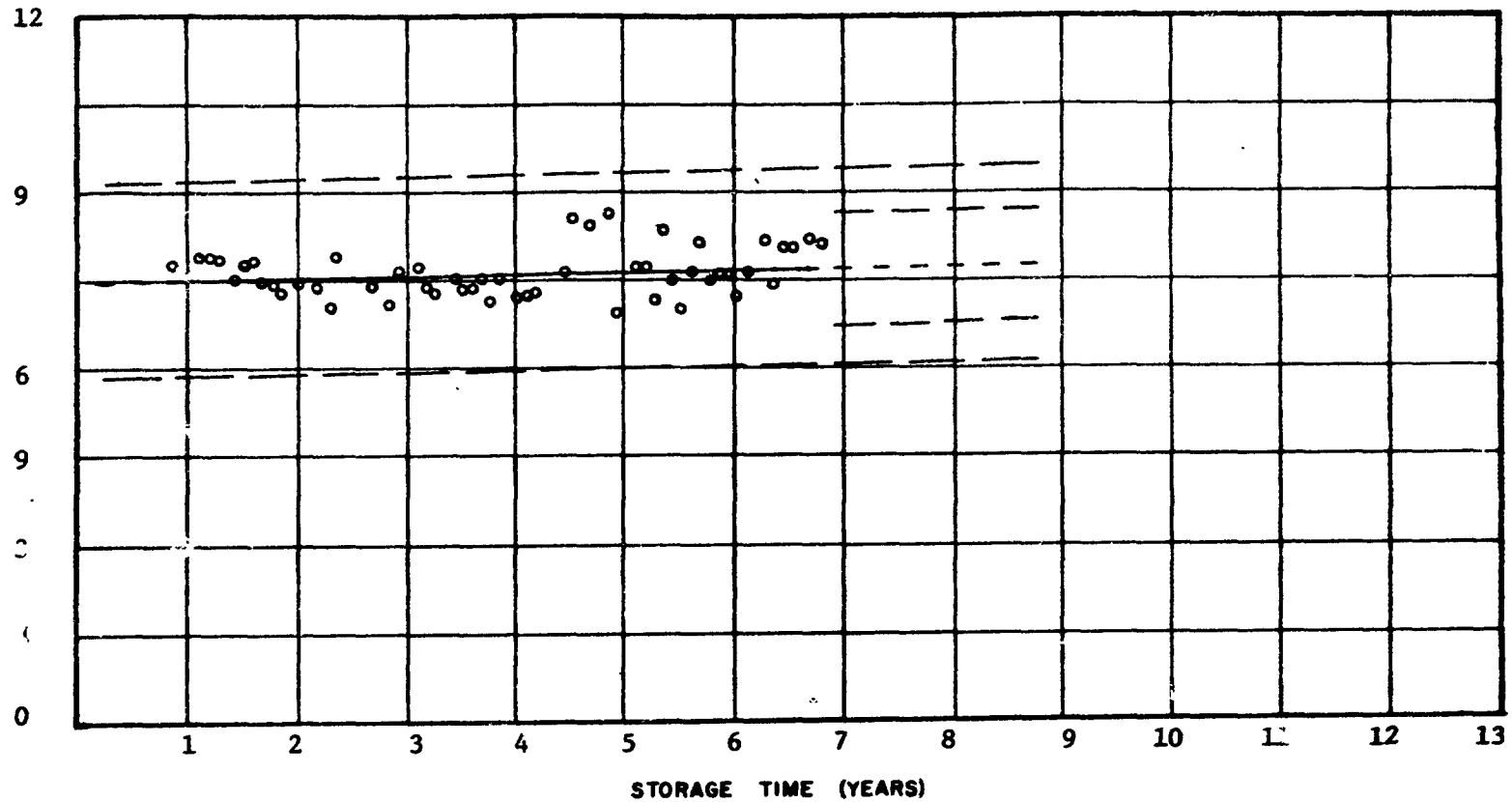
CORRELATION +0.1690
SIG OF CORRELATION Significant
STD ERROR OF y ($S_{y \cdot x}$) 0.001422
STD ERROR OF REG COEFF 0.000000
CALC "t", SLOPE 2.9797
"t" REQ'D FOR SIG at 95% 1.960
STORAGE COND Ambient
TEST COND 77°F, ambient RH

Stage I Wing 6, TP-H 1011, Sol Gel, Cross-Link Density
Figure 86

SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
10.00	4	32.00	4	49.00	12	67.00	8
13.00	4	34.00	4	50.00	8	68.00	4
14.00	4	35.00	8	53.00	12	69.00	8
15.00	4	37.00	4	54.00	4	70.00	8
17.00	4	38.00	8	56.00	4	71.00	16
18.00	4	39.00	4	58.00	4	72.00	4
19.00	8	41.00	4	59.00	4	73.00	8
20.00	4	42.00	4	61.00	8	75.00	4
21.00	4	43.00	4	62.00	8	76.00	8
22.00	4	44.00	4	63.00	8	77.00	8
24.00	4	45.00	4	64.00	4	78.00	4
26.00	4	46.00	4	65.00	12	80.00	4
27.00	4	48.00	8	66.00	4	81.00	4
28.00	4						304

Stage I Wing 6, TP-H 1011, Sol Gel, % Extractables



——— – – – —REGRESSION LINE
— — — —90-90 TOLERANCE BAND
—— —— ——3 SIGMA BAND
FAILURE CRITERIA
RANGE OF DATA
o MEAN VALLE OF DATA:
OOAMA MEAN

APPROVED, DAPF, JULY 70, LD.

REG EQ Y=7.4764 + 0.0027 (X)
F RATIO 2.938
DEG OF FREEDOM 1 and 302
SIG OF F Not Significant
STD DEV OF y (σy) 0.5485
n 304
SPEC CONFIG 1/2"x1/2"x1/2"

CORRELATION +0.0982
SIG OF CORRELATION Not Significant
STD ERROR OF y ($S_{y.x}$) 0.5468
STD ERROR OF REG COEFF 0.0016
CALC "t", SLOPE 1.7139
"t" REQ'D FOR SIG at 95% 1.960
STORAGE COND Ambient
TEST COND 77°F, Ambient RH

Stage I Wing 6, TP-H 1011, Sol Gel, % Extractables
Figure 87

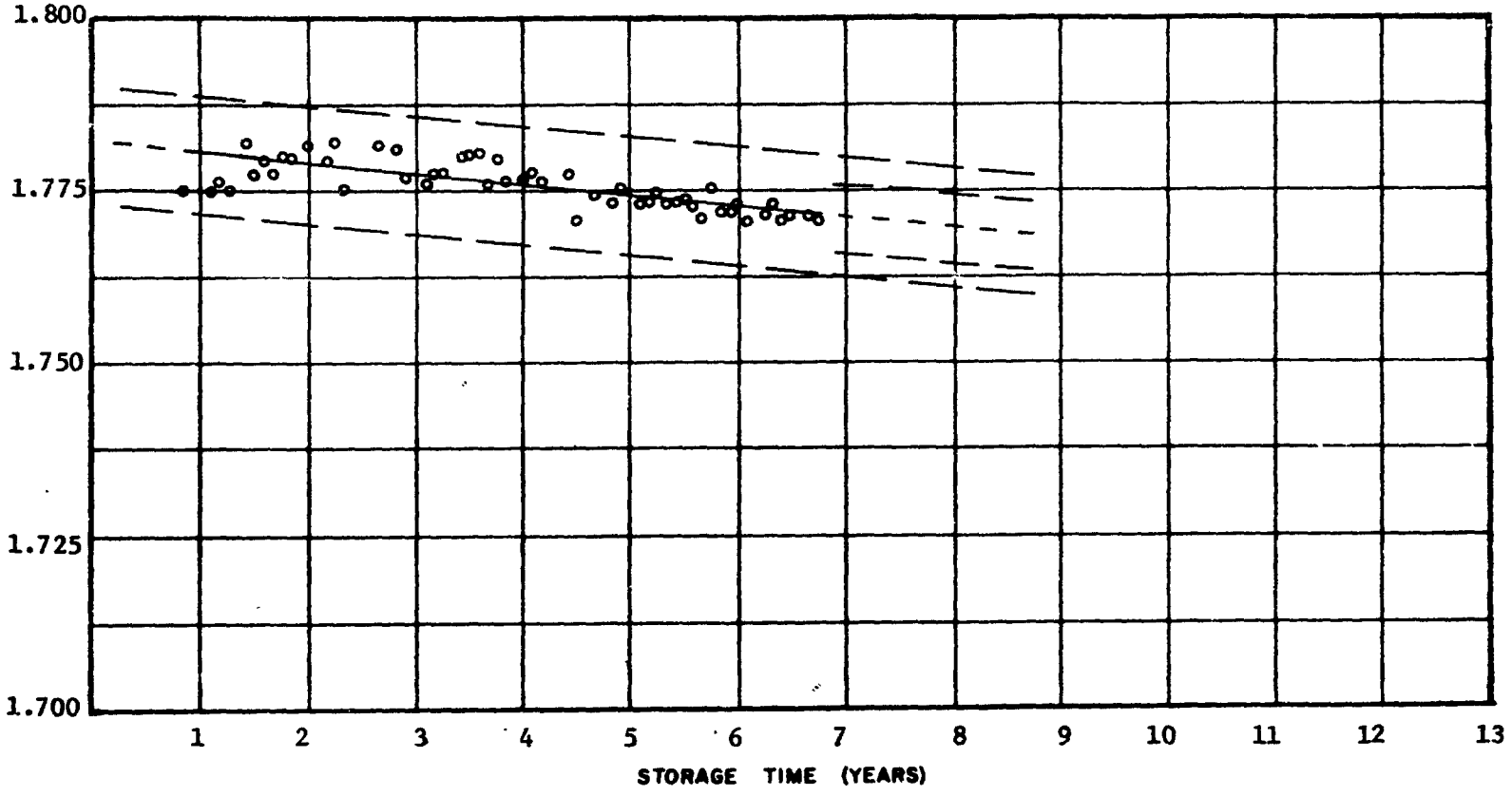
SAMPLE SIZE SUMMARY

Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples	Age (months)	Nr Samples
10.00	4	32.00	4	49.00	12	67.00	8
13.00	4	34.00	4	50.00	8	68.00	4
14.00	4	35.00	8	53.00	12	69.00	8
15.00	4	37.00	4	54.00	4	70.00	8
17.00	4	38.00	8	56.00	4	71.00	16
18.00	4	39.00	4	58.00	4	72.00	4
19.00	8	41.00	4	59.00	4	73.00	8
20.00	4	42.00	4	61.00	8	75.00	4
21.00	4	43.00	4	62.00	8	76.00	8
22.00	4	44.00	4	63.00	8	77.00	8
24.00	4	45.00	4	64.00	4	78.00	4
26.00	4	46.00	4	65.00	12	80.00	4
27.00	4	48.00	8	66.00	4	81.00	4
28.00	4						304

Stage I Wing 6, TP-H 1011, Sol Gel, Density

PARAMETER Density

UNIT OF MEASURE grams/CC



——— – – – —REGRESSION LINE

— — — —90-90 TOLERANCE BAND

—— —— ——3 SIGMA BAND

FAILURE CRITERIA

RANGE OF DATA

o MEAN VALUE OF DATA:

OOAMA MEAN

APPROVED, DAPF, JULY 70, LD.

REG EQ Y = 1.781996 - 0.000125(X)

F RATIO 244.5280

DEG OF FREEDOM 1 and 302

SIG OF F Significant

STD DEV OF y (σy) 0.003744

n 304

SPEC CONFIG 1/2" x 1/2" x 1/2"

CORRELATION - 0.6689

SIG OF CORRELATION Significant

STD ERROR OF y ($S_{y \cdot x}$) 0.002787

STD ERROR OF REG COEFF 0.000010

CALC "t", SLOPE 15.6374

"t" REQ'D FOR SIG at 95% 1.960

STORAGE COND Ambient

TEST COND 77°F, ambient RH

Stage I Wing 6, TP-H 1011, Sol Gel, Density
Figure 88

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